The Builder.

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Hastings Congress of British Archæological Association

On Monday last, the Mayor of Hastings and the Corporation of the Borough received the members of the British Archæological Association in the Town-hall, if such a hole as it is deserve the name, and the Mayor, in a few hearty words, welcomed them to the town, the more so as it was the eighth centenary of the great battle in this neighbourhood which changed the ruling power in England.

The Earl of Chichester, as president of the congress, then addressed the meeting. He had no intention, he said, to occupy much of the time of the Association, which would be better employed in listening to the interesting information to be given by gentlemen learned in archæology who were to favour them with papers. It would have been a pleasure to him, not only as president of the Association, but as owner of the ancient castle of Hastings, to have entertained the congress there; but unfortunately it was not in a condition fitted for dispensing hospitality; there was not even a kitchen left. He did not profess to be a working bee in the archæological hive, but he had always taken a great interest in it, and valued much the honey which the working bees (for whom he entertained a great respect) brought home. Every one who studied history must value such labours, for they gave us insight into the inner life and character of our ancestors; and this was the real object of history, for it improved our knowledge of human nature. His lordship alluded to some prominent points of interest in the neighbourhood, especially to the battle-field of eight centuries since, and said that the Dowager Lady Webster had a large collection of interesting relics of the field, which she would be happy to allow any of the members to see.

Mr. Godwin, in proposing, as a vice-president of the Association, a vote of thanks to Lord Chichester, referred to the series of works to be found in Sussex from the camps of the Britons to the marvellous watering-places of the present day; eulogised the Sussex Archæological Society; and said he looked to see some county histories more worthy of the name than many of those that existed, grow out of the labours of the various cognate societies.

Mr. Planché, Somerset Herald, having seconded the motion, it was carried with acclamation. So, too, was a vote of thanks to the Mayor, proposed by Mr. A. Goldsmid; and this being done, the members went round the town to view its antiquities. Hastings, though an ancient place (the terminating *Ing* marks it as a Saxon settlement), has few remains, besides the Castle, that possess much interest. Some few of the old houses, half-timbered, with brick chimney stacks, are picturesque. On the front of one is a date oddly expressed, which may mean 1610, and has the Pelham buckle above and between two 1's or two I's. The tower of St. Clement's Church retains two balls left in it by the combined French and Dutch fleet in 1720. All Saints', as many of our readers know, is capitally placed, and forms a considerable ornament to the outskirt of the town. It is in a miserable state of dilapidation and disfigurement, and ought to receive immediate attention. If the parish to which it belongs be too poor to set this building properly in order, the other parishes should aid it. The whole town is interested in keeping up its antiquities. This and a decent town-hall should be amongst the first works of the borough. Mr. W. J. Gant gave a few particulars of the Church; and Dr. Greenhill spoke of the parish registers. These date from 1527, if we remember the figures rightly,—at any rate, from the first half of the sixteenth century. The scoundrel Titus Oates was christened here. The house in which he was born had been previously looked at. Infamy and fame get jumbled up by time.

The East Cliff was visited, together with the embankment, that has been thought, erroneously we should say, to mark the place of William's camp before his army left for Battle,—which word, by the way, may be read with two meanings. On this hill, and near the sea, is a plot of ground which belongs to All Saints' Church; and to the west of this place, on the extreme south-west point of the hill, Mr. Ross, some years since, made excavations which resulted in his unearthing the remains of a wall and tower, and a number of human skeletons, at two different elevations, those at the lower lying on charcoal, and with each skull resting on an oyster-shell. Large nails were also found with them. After looking at the "Mercers' Bank," and the "Lady's Parlour," the band of inquirers reached the Castle, and were received by Lord Chichester. Mr. Gant gave a few particulars, and seemed to suggest that some of the remains were Roman. This, however, was properly demurred to by Mr. Edward Roberts, F.S.A., and others. There was a "castle" there before William came, but this might have been only earthworks. Mr. Godwin added, that he had examined the whole of the walls pretty carefully, and had not found the slightest evidence of Roman work. He had seen one or two masons' marks on the earliest parts some time ago, and these were Norman. Mr. T. H. Cole, M.A., and Mr. Levien, M.A., also took part in the conversation. The remains of the chapel excited, as usual, much discussion. The chancel arch was built up some years ago, exceedingly well as a matter of masonry, under the direction of the late Mr. Kay, architect, out of remains found on the spot. The piers, *in situ*, would seem to be Transition Norman; the arch above of somewhat later date.

At the dinner afterwards Lord Chichester presided, and one or two speeches were made. In the evening, Mr. Robertson, M.P., presiding,

Mr. Planché, Somerset Herald, read a paper on "The Bayeux Tapestry," which was illustrated by a full-sized drawing of the tapestry, and afforded extreme gratification. We shall print it in full in our next number. A discussion ensued, in which the chairman, the Mayor of Hastings, Mr. Roberts, Mr. Godwin, and others took part.

The party were well received on Tuesday by the Mayor at Rye and the Mayor at Winchelsea. Mr. Slade Butler, F.S.A., at the former place, and Captain Curteis Stileman at the latter, acted as *ciceroni*, and showed all the antiquities. Some discussions occurred at the Church in Winchelsea, as a record gives 1460 as the date of the north aisle, while the windows are late Geometric Decorated, and the same as in the south aisle. The tombs, the canopies of which it was pointed out were like those at Aldworth, in Berks, were, of course, much admired. The Mayor of Winchelsea gave refreshment, as did also Captain Stileman, at his charming residence the "Friary." Some notes of both these most interesting towns, Rye and Winchelsea, will be found in earlier volumes of our journal.

Papers were read at night, after returning to Hastings, Sir S. Scott in the chair, and to which we may return.

Wednesday was devoted to Mayfield Palace, where Mr. Roberts was guide; and we shall best use the space at our disposal by giving the pith of his discourse.

Mayfield.

The publications of the Sussex Archæological Society which contain not merely a documentary history, as far as at present has been ascertained, of this palace of the Archbishops of Canterbury, but, scattered throughout the many excellent volumes of the "Collections," many collateral notices of the place and persons, leave little to be done in that direction; but there are still some points not cleared up which I hope, by further search amongst other records, to ascertain.

There are besides no complete drawings nor any detailed notices of the remains except incidental to other subjects, and the Sussex Society has not yet made a visit to the spot. Under these circumstances I have undertaken an investigation, and trust that, although I may advance little that is new as regards one of the most interesting of dwellings, and one so well known, you will be gratified with an inspection made under more favourable circumstances than persons have enjoyed previously, and with accurate plans before you.

It may be stated generally that all residences, whether purely castles or purely domestic, partook very much of the same character during all the period known as Mediæval; indeed, the earlier domestic buildings were necessarily defensible. In this palace, however, there is an absence of every appearance of defence, except in the strong, though not lofty, inclosing wall, parts of which are still as good and perfect as when first built, and in the somewhat more castellated appearance of the gate-house. Even churches and monasteries were not unlikely to undergo sieges,—the towers of the former in early times being probably a refuge for the inhabitants, and in the latter the manorial powers were more peacefully exercised than by the warlike secular lords. This palace, as I have said, exhibits none of these characteristics, and shows the peacefulness of the times and security of this part of the country in the days of the Edwards. That it was not wholly defenceless may be gathered from the fact, that a piece of ordnance now lies in the forecourt which was taken from the tower; and although this is of the seventeenth century, yet it may be argued that some previous kind of defensive arrangement was deemed necessary. There were, however, other enemies than warlike ones, for a serious fire occurred in the town in 1389, by which the church and great part of the town were destroyed. It does not appear, however to have extended to the palace.

Of the history as given by Mr. Henry Rosehurst Hoare, to which I must refer, I need only give some leading points, and I need not here discuss it: some small matters occur in which I draw different conclusions. It appears from that paper and some others that nothing is known about the builders of the structure which now exists. Some inferences are drawn from certain accounts of large expenditures of money; and it will be seen that, by induction from the stones themselves, I come to the conclusion nearly identical with Mr. Hoare's,—thus, reasoning from opposite bases, we meet at the same point.

It is shown that as far back as 988 there was a palace of St. Dunstan's here, called Maghefield-place, and from that time until the reign of Henry VIII. there was an ecclesiastical palace. There were councils held here many times in the

early part of the fourteenth century before the era of the present hall. There were also regal guests repeatedly in the thirteenth century, with considerable preparations for the entertainment of these guests and their retainers, of whom a modern prelate or nobleman, or even the Queen herself, would be heartily ashamed now-a-days if they allowed either themselves or their hosts to be troubled with them. There appear, however, occasionally to have been some scruples, for we find recorded some items in the royal expenditure such as this:—"*Pro damno in domibus suis et curtilagio suo.*"

This occurs in the time when King Edward I. was guest at Mayfield of one Arnold de Uckfield, to whom the compensation was paid. It is quite clear, however, from the same entry, that the king did not on that occasion lodge at the old palace, and that there were other important houses near.

The place is said to have been a favourite residence of the archbishops, and, viewing the beautiful country around and through which we pass, this cannot surprise us,—though we must make allowance, also, for the change of the face of the country by reason of the clearing of the forest and the increased acreage of cultivated land. It also would appear that they were not unfavourable to dying there, for three are recorded to have ended their lives in the palace, including Simon Islip, who was Archbishop of Canterbury from 1349 to 1366, and to whom we owe the present hall, as well as some other buildings which, until I made the discovery a few days ago, were not known to exist: these I will point out as we go round the palace. It appears that he resided here in 1350, when he must have made arrangements for the alteration and rebuilding; the hall dating from 1350 to 1360.

There are, moreover, some still earlier portions and remnants dating from about 1200 to 1300; and these are the earliest signs I have been able to discover.

I may here mention the present mode of spelling the name, Mayfield. This is merely a phonetic mode of rendering that which has always been pronounced so, though spelt Maghefield. Without giving you instances, it will be clear that there are many similar examples of the silent *g*. We get an explanation in No. 6,344 of the additional MSS. British Museum, where it is said to correspond with also Welsh and Irish. The same thing occurs at Bayham, which was originally spelt Begham. As regards the descriptions of the buildings which have preceded mine, I must, kindly I hope, protest against the indiscriminate adoption of still earlier accounts which are not trustworthy, without any verification, thus perpetuating errors which the slightest examination would prevent; and this occurs even in that otherwise excellent paper the most recent on the subject.

Before, however, I proceed to give you a detailed description, which will be, as we proceed, over the buildings, I will refer to some recent changes and royal visits.

Archbishop Cranmer, in 1545, exchanged the palace with Henry VIII. By him it was granted to Sir Ewart North, and by sales it came to the hands of Sir Thomas Gresham. A date carved on the chimney-piece in the room which is popularly known as Queen Elizabeth's room, 1371, has been supposed to be intended for 1571. I think the grasshoppers in medallions on the same chimney-piece point to the fact that it was fitted up by Sir Thomas, and probably in 1571, as he was then occupying the mansion, and two years after received a visit from Queen Elizabeth.

The buildings may, in general terms, be said to consist of a great hall lying nearly east and west, with the retainers' department on the west, and the archbishop's on the east, with the culinary offices and cellars beneath. There is, of course, an imputation of an underground passage, though in this instance it is said to be to the church adjacent. I assume that as usual some system of sewerage has given rise to the statement. I cannot do more than point to some masonry underground, beyond which is a modern brick vault, which I am told extends to a considerable length outside the wall under the churchyard.

There has not been a chapel discovered, but on an examination, and perhaps with a predetermination to find one,—for I am persuaded no mansion of this character was without it,—I have fixed on a spot towards the north-east of the ruins. My reasons for fixing on that as the chapel are, that it is accessible by three different ways, and that the window is slightly more ornate, and placed much too high from the floor of the apartment for any other purpose than placing an altar beneath it.

The buildings have been, as usual, made use of as a quarry: many portions were standing within a century. The modern house next to the Gatehouse, on the west, was erected from the materials, and the master builder received as a payment the Gatehouse itself in lieu of money.

Commencing with the Great Hall, which is about 70 ft. by 39 ft., I must point out to you the differences there are between the present roof and that which must have been originally placed over it. There is, no doubt, great difficulty in determining what that roof was, because the form of the walling surmounting the stone ribs points either to a clerestory on the same principle as is adopted in modern railway sheds, or the ceiling was boarded, giving a slope on each side, and a flat centre part. That there was some kind of floor or joisting at one end is certain, for photographs and drawings, going back for a century, show a series of holes for timber at the west end. My own opinion is that there could not have been a room over the middle part, and therefore that there was a kind of dormer or clerestory, instead of what was called a funorel for the escape of smoke; a cone, perhaps, for light; for it is certain, too, that all the windows were furnished with shutters, and their lower parts were without glass, there being no grooves, and there are special appliances for preventing the rain from penetrating below the shutters when closed. Glass was a valuable commodity, and was packed away, when the owner was away, with as great care as is exercised in modern houses with regard to valuables.

The dais had an unusual feature—namely, a throne attached to the wall; the diaper work of the back remains. There are two ways to the offices, one to the kitchen, and another to the cellars: the latter has always been called a cupboard, but I will show you that the end of it is a modern wall, and that there was a continuation beyond, so that the cellarer could enter without passing through or near the archbishop's own door.

There was formerly a north door as well as a south or main door: this led to buildings which extended to some distance for the retinue. Probably there were two galleries at the west end of the hall.

The changes which have been made at the west end and tower prevent my giving any opinion, as I was not previously acquainted with the ruins. There are some cupboards which probably were used for putting away some of the table appliances below the salt. It has been called the buttery, but it is not likely that that office would be detached from both cellar and kitchen. I am not, however, prepared to say that it might not have been so used in connexion with the destroyed part northwards. I will point out the great kitchen, buttery, and offices, the grand staircase, the presence chamber, a great parlour, and the withdrawing room, with the newly-discovered early window, which has been concealed for a century. The partition is modern, and I have omitted it, as well as all modern walls from my plans. The whole of the chambers and rooms communicate, and may be said to encircle an inner court. Some additions have been made for private use, and for additional facilities of getting about. All these buildings, except the early portion named, are of the fifteenth century (Tudor).

There was a large and handsome park to the north, and we can see the inevitable fish-ponds still.

The buildings have been recently restored, and Mr. Roberts was complimentary to the architect employed. Thursday was to be given to Battle Abbey—Mr. Gordon M. Hills conducting,—and to Robertsbridge Abbey. Amongst the members and visitors attending the meeting, in addition to those already named, are Sir Sibbald Scott, Sir Charles Broughton, Professor and Mrs. Willis, Mr. E. M. Ward, R.A., Mr. and Mrs. S. C. Hall, Mr. Hannah, Mr. G. G. Adams, Mr. Habershon, Mr. T. Hare, Mr. Teniswood, Mr. H. Godwin, F.S.A. (of Newbury), Mr. W. Poole King (of Bristol), Mr. Lang (of Bristol), Mr. C. Whiting, Alderman Ross, the Vicar of All Saints, and many others: Mr. G. R. Wright, F.S.A., conducting the excursions, efficiently as usual.

The London, Brighton, and South Coast Railway Company, or rather the directors thereof, have not won golden opinions of the Association. When asked to allow return tickets to last a week, as always given on such occasions by other companies, they declined to do more than grant tickets for four days,—an absurd offer, which was, of course, declined, as it would have broken up the congress before its time. Later in the week, too, the directors withdrew the permission they had previously given, that the Association might have a special train, to be paid for, of course, for the excursion to Lewes and back.

VISIT TO A KESWICK PENCIL-MILL.*

We must tell our readers, if they have never taken a tour through the English lakes, and stayed to admire the beauties of the town of Keswick, that there is still a pleasure in store for them — a green spot which is still fresh and unoccupied. They will see a charming and romantic stretch of mountain and lake scenery; a picturesque yet quaint old English market-town; a modern railway hotel of great excellence in its resources, and, what is more, of rare moderation in its charges: these material circumstances, enhanced by the pure and salubrious mountain atmosphere, will give their spiritual nature an invigorating impulse, and render them more in love with their species and with their country.

Situated in the beautiful valley of Derwentwater, and under the very shadow of Skiddaw who rears his snowy peaks to an elevation of more than 3,000 ft., watered by the gentle Greta, where Southey loved to dwell, and cheered by the murmuring ripples of the silver lake there is no place, perhaps, in England, where a pure lover of the picturesque in nature can be so fully gratified. To the painter and the poet such a luxuriant feast is not often vouchsafed—even under Italian skies.

Whatever there is of beauty special to the other districts is here in ripest fullness. Crag and fell; the evidence of the mountain top and the secrets of the dale; gentle river and bawling stream; the turbulent ghyll and the grander force; the lake hiding itself away in bays, starred with water-lilies and blue with lobelia, or dashing round rocky promontories, where it beats up in waves that are almost billows in the heavy winds of winter, or bossed with islands endowed by legends and beautified by poems: distant prospects leading down to the dark blue sea and over to Cumberland's old enemy, Scotland, beyond; and home-views across one's own garden that touch the heart like the face of a fair child: nothing is wanting, and nothing is left unfinished, as where the hills rise up only as a kind of hood at the head but wander off into undeveloped fells at the foot—here they are set all round the vale in equal majesty—a rampart or a crown, as one's mood would phrase it.†

Our intention, however, is not at present to describe the lovely landscape nor to chronicle its associations. This duty we must consign to the charge of Eliza Lynn Linton — who, we believe, is native there, and to the manner born. For the present our business is more of a utilitarian character.

In a previous article we described the circumstances which contributed to make Keswick the seat of the pencil trade.‡ We now propose to describe that trade itself from the point of view with which we set out.

Pencils, we should explain, however, did not always constitute the staple manufacture of Keswick. During the principal part of last century the woollen manufacture was the chief occupation of the place. Keswick, indeed, was at one time the emporium of the woollen trade for Cumberland; and its yarns and cloths also formed a considerable item of exportation to the neighbouring towns of Westmoreland. It was, we suppose, with the pious intention of securing this trade to the town that the following legend was composed, which is cut in large clear letters in a flagstone, and is built into the wall over the entrance to the Greta pencil-mill:—

"May God Almighty grant his aid
To Keswick and its woollen trade!"

It is a delicate subject in these days of cattle plague and cholera morbus—when the highest authorities are at variance with respect to the reasonableness and duty of intercessory prayers for the averting of calamity—but it is our duty

* See p. 557, *ante*.

† "The Lake Country," by E. Lynn Linton, London, 4to, 1864, p. 49.

‡ See p. 557, *ante*.

as honest chroniclers to tell the truth. During the early part of the present century the woollen trade began to decline; it was undersold, in fact, by Yorkshire and Lancashire manufacturers; the construction of railways gave it a fatal and irrecoverable blow; and now at the period of our visit it is almost, if not altogether extinguished. So true is the proverb "*L'homme propose, mais Dieu dispose!*"

But another trade of at least equal importance sprang up to succeed it—the trade of manufacturing black-lead pencils from the plumbago of the Borrowdale mine. As we have stated, this trade originally took root under the fostering care of the Jews in London; and it was conducted after the manner of the tribes of Israel. They set up a sort of rialto, or public market, for plumbago, in Essex-street, Strand, where on stated days, once in a month, the commodity was sold by auction to the pencil-makers. There was at that time a host of small makers in London, each subordinate, perhaps, to one wholesale dealer. But about the year 1820 the Keswick people, under the honest Cumbrian conviction that they had some right to the craft, took up the trade themselves; improvements were made in the manufacture; machinery was invented and applied; and the production everyway increased. The consequence is, that since then it has continued to be the seat of the manufacture in England, and the staple product of the place, even when the mineral on which it was founded is no longer wrought with advantage at the native mines. Indeed, at this moment, with formidable competition in London and on the Continent, the principal part of the black-lead pencil manufacture of England, is concentrated in Keswick.

Although more than 100 years had elapsed since the mineral, which we term graphite, had been wrought in the Cumberland mountains and had been applied to the purpose of making pencils, we are not to suppose for a moment that this curious manufacture reached its present high state of perfection all at once. Up to a period within the last forty years, the few pencils in use were produced by hand labour, and were sold at a price of 1s. and 1s. 6d. each! a sum for which it is now possible to purchase a gross, or twelve dozen, of certain qualities. These hand-made pencils consisted exclusively of the kind which are still manufactured here, and are known in the trade as "pure Borrowdale lead." Some of our older readers will also remember the cylindrical sticks of solid plumbago which were much in vogue with schoolboys,

"In our hot youth, when George the Fourth was king,"

and which resembled nothing so much as the cylindrical slate-pencil of modern days, all the more that they were often encased in a common reed. This was obviously a prodigious waste of matter, inasmuch as the point of the pencil being only required for all practical purposes, the surrounding cylinder had to be pared away. The first great step, therefore, in the economical history of the pencil was the utilisation of this waste matter by substituting for it an exterior cylinder of cedar or other suitable timber. Like all great economical appliances, this was also attended with collateral benefits. For not only does the cheap timber replace the valuable mineral, and therefore make the pencil *cheaper*, but it makes it *stronger*, by the law of trussed beams, and it makes it *cleaner*, on the principle that cedar does not soil the hands. We have no means of discovering who was the author of this invention, or whether, like most great inventions, it had several authors. But this simple idea has been productive of much fine gold in England in our time, particularly in Keswick, as we shall proceed to show.

There are now altogether five pencil-mills at work in Keswick. The old-established firm of Banks & Co., which is still the largest, has recently passed into the hands of Mr. Gibson, of the *Cumberland Pacquet*. Next in importance is the Greta Bridge, Mill, which gives, we believe, the greatest facilities for inspection. It is the property of Mr. Robert Wilson, who, we believe, was a principal shareholder in the Wad mine, and to whom we confess our obligation for the information we have been able to supply. As far as we could discover there is little or no jealousy between the Keswick pencil-makers. They are something like the Sheffield file-makers, or the Aberdeen comb-workers — at peace with each other: arising from the fact probably that there is plenty of room for them all in the market, which is of the largest, we must own, since it consists of the civilized world.

We must now take a glance at the process of production; and to this end we must ask the reader to accompany us in a walk through the Greta Bridge Mill which lies opposite that memorable house where Southey lived and died. All the mills, we may mention, consist of houses with several floors, and are situated on the banks of the Greta, the water-power of which picturesque river furnishes the motive power for the whole of them. This water supply, we accidentally learnt, is much in want of regulation; for the Greta, like all mountain streams, occasionally turns into a mountain torrent; in other words, there is a flood on the river, and during this flood the mills must stop. The Greta Mill has a curious, quaint, old-fashioned appearance; having originally been built and devoutly consecrated for a woollen mill under the circumstances we have mentioned. The interior is equally curious—something of a compound between a country saw-mill and a paint manufactory. On entering the workshop the senses are variously affected by the different objects, — the eye by the machinery and the dull black lustre of the objects,—the ear by the hum of endless belts and the skurr of circular saws; and the nostrils get irritated by the flood of fine cedar dust which pervades the whole atmosphere. Indeed the whole process of manufacturing pencils may be reduced to four radical types or root processes,—the grinding and pressing of lead; and the sawing and turning of wood.

But in order to make our description somewhat clear,—which cannot be adequately performed without diagrams,—we subjoin a sort of compendium or *vidimus* of the manufacture, in which the figures represent the order of the processes. The manufacture of a black-lead pencil then consists in—

1. Cutting the cedar logs to the proper lengths.
2. Cutting these lengths into thin planks.
3. Dividing those planks into strips—oblong on section—and of the length of three or four pencils.
4. Simultaneously with 3. Cutting the groove for reception of the lead.
5. Preparing the lead.
   - (*a.*) *Simple.* Cutting parallelopipeds of lead from mineral.
   - (*b.*) *Complex.* Mixing, crushing, grinding, solidifying under pressure, baking, and cutting of lead from block.
   - (*c.*) *Inferior mixtures.*
6. Selecting or sorting of wood (knots rejected).
7. Selecting or sorting of lead (for uniformity of colour and hardness).
8. Fitting lead into grooves of wood (shutting).
9. Glueing on outside piece over lead (fastening).
10. Rounding the lengths of cedar (gouging).
11. Polishing surfaces.
12. Varnishing (when necessary).
13. Cutting ends clean.
14. Stamping maker's name.
15. Gilding ditto (over varnish only).

It will of course be impossible within our limits to discuss these processes in their order; but indeed that is unnecessary. We shall just take a glance at the most important circumstances, beginning with the timber that is used.

For every black-lead pencil, except the large and coarse pencils used by artisans, in which case yellow pine is substituted, the timber covering usually employed is formed of Florida or South American Cedar. The logs of this timber, which are stored in Keswick after their voyage, amount to a considerable quantity of cubic feet in the year. Cutting the logs and planks needs no illustration, but the next process, that of dividing the planks into strips, is very curious. It consists of cutting the wood with two circular saws with their planes at right angles, which perform at the same time the double operation of cutting the square pencil from the block of cedar and grooving it ready to receive the lead. By means of this machine, the planks are cut into straight square sticks, each having a groove on one surface for the reception of the lead. The saws turn on the lathe at the rate of 2,000 revolutions in a minute; and 1,200 pencils can be thus cut out by one man in an hour.

The next step is to fill these grooves with the small pieces or parallelopipeds of black lead, which really constitute the pencil, or at least its most essential part—its heart and soul a poet would say. But we must explain how this lead is prepared. In pure Cumberland lead it requires only to be cut to the requisite scantlings. This is in fact the finest drawing pencils for artists and engineers. The lead used for commercial purposes generally is prepared lead, and goes through the following variety of processes, which correspond with our "complex" subdivision under article five.

1. *Grinding.*—This is what we may term the basic process of the manufacture, and is undoubtedly the most laborious.

This process is effected by means of granite mills, which revolve at a slow speed. The lead is ground in water, and the operation is repeated over and over again until it acquires the consistency of a complete pulp. This grinding is a difficult and protracted business, the mills sometimes revolving twenty-eight days at a stretch, the lead being run in, and turned over twice a day. It is so fine at length after such a lengthened levigation, that you cannot distinguish the smallest particle with your tongue; in other words, it is now a pulp of plumbago, absolutely free from extraneous matter or gritty particles.

2. *Mixing.*—The amalgam, which is added during this process, consists of antimony and other fusible metals. The object of this is to give additional cohesion to the mass, and greater capacity of standing a point. Such a method of hardening plumbago, was for long a desideratum; and it is, we could see, the only part of the process which the manufacturers affect to keep a secret. There is great variety in the colour of different qualities of black lead; and it has been alleged that by a judicious mixture of these alone almost any shade of black may be procured. But an inferior black may also be obtained either by the use of sulphur itself, or by sulphuret of antimony. These were points, however, upon which we did not press for information.

3. *Baking.*—This finely ground pulp is then dried, and put into a massive crucible, which is transferred to a furnace, and heated to a white heat nearly. The object of this is to restore, as far as we could understand, that molecular cohesion which the process of grinding had destroyed; and to bring about a more intimate union of the particles of amalgamated matter. The chemical reaction, however, here must be very obscure.

5. *Pressing.*—After coming out from the crucible the mass of black lead is subjected to an enormous pressure by means of a hydraulic press. It may appear a very simple process to press the powdered, or rather pulpy, graphite into hard blocks; but it is found very difficult in practice, so much so as almost to prevent the employment of this method, which has led to immense improvement in pencil making. It was found at first that the difficulty of pressing out the contained air was so great that the presses were broken under the weight required. Pressure in a vacuum was then tried, but the difficulty of applying it was found almost insurmountable, and it was certainly unprofitable. The late Mr. Brockedon, a London manufacturer, who was famous for his pencils, is said to have surmounted the difficulty by a process of compressing the black lead into blocks two or three inches square, with only moderate pressure. These blocks are then coated over with paper well glued, so that, when dry, the covering is air-tight. A small hole is now made through this coating on one side, and several of these cubes of black lead are put under the receiver of an air-pump, and the air being exhausted completely from them, the orifice in each is closed by an adhesive wafer, which prevents the return of the air when they are taken out of the receiver. They are next placed under the hydraulic press, and a well-sustained and regular pressure is brought to bear upon them for twenty-four hours, after which they are found to be so completely consolidated that, in cutting them, the substance is equal in density to the best specimens of unprepared graphite.

This account of the process of pressing we take nearly as it stands upon the authority of a writer in "Chambers's Encyclopædia." But we ought to say that it is not in operation in Keswick, as far as we could ascertain. These blocks—which turn out about 6 × 6 × 3 in. —after suffering a pressure of several tons to the square inch, are now ready for the last process, which is that of—

6. *Cutting the Lead*, which is done by means of a fine hand-saw, first in the form of thin plates about sixteenth of an inch in thickness, and then by cutting these plates across to form small square sticks one-sixteenth of an inch in

section, and usually about three inches long. Here we at last arrive at the pencil leads.

Considerable judgment has now to be exercised in selecting leads of an equal degree of hardness and of colour; and the same may be said of the timber sticks which pass through the hands of a sorter, who rejects all pieces full of knots or other irregularities.

In order to study the process of combination, we must next visit the benches at which the lead is fitted into the grooves in the strips of cedar. The men here at work present a peculiar appearance. They are dressed in dark blue smocks—this being the general costume of the place—with loose sleeves fitted tight at the wrist, and are sitting at very black shining tables. The men's hands, and the tools with which they are engaged, as well as most of the furniture of the apartment, look as if they had been freshly polished every morning, after the same fashion in which the servant-girls polish our grates and stoves,—only their faces often exhibit tints and streaks of different colours. Even when the workmen have knocked off, and have had their faces washed, we could not but distinguish them from their peculiar swarthiness and greasiness of physiognomy. Each workman has a number of the sticks of cedar in which the grooves have been cut, and a number of slices of lead, just as they appear after the sawing. He then takes one of the slices, and having seen that it is not too thick to enter the groove—for if this be the case he rubs it down to its proper dimensions on a rough stone, which lies in front of him—he dips it in a pot of glue, which is kept hot just beside him, and then presses it into the grooves. He then gives a scratch to the lead on a level with the surface of the wood, and breaks it off, so as to leave the groove properly filled.

In the making of a single pencil two or three slice lengths are required; but however many there may be, each slice is fitted exactly endwise to the other, so as to leave no intervals. Should any of the lead afterwards project above the grooves in the cedar it is scraped off with a knife; this is called *shutting*. The rods being thus filled are conveyed to the fastener-up. This operation is carried on with surprising dexterity. The workman glues the cedar covers or slips over the rods filled with lead, and having got a certain number arranged alongside of each other, he fixes them tightly together by means of a wedge and framework, and then lays them aside to dry.

The pencil now presents the appearance of an oblong cedar stick, very rough and long, and it is removed downstairs, to be rounded. The "rounding-machine," by which this is accomplished, is very curious. A man takes in each hand one of the long sticks, and places them between the pairs of small wheels, which are situated just far enough apart to admit the pencil. By these means they are brought under the action of a revolving cutter, which is made so as to act with a gouge and a chisel-blade; and in a moment we see the end of the pencil passing out rounded to a nicety. By this simple and efficient machine a man will round from 1,000 to 1,200 dozens of pencils a day. This process being completed, the long sticks are taken to the floor from which they were brought, in order to be finally smoothed with a plane, and polished. We may add here that the sexagon or octagon shape of pencils which are now so fashionable in some quarters, are produced either by the hand-plane, or more speedily and accurately by machinery such as that we have just described.

We need not stay to describe the process of varnishing, nor to express our admiration of the highly ingenious machinery by which the ultimate processes are effected. The last process to which we will allude is that of stamping the maker's name, which is done almost with the speed of lightning, by a curious revolving die; and the singular letters and combination of letters which represent the quality of the pencil are impressed at the same time. These letters are H, HH, HHH, B, BB, BBB, HB, FS. H signifies *hard*, repeated twice and thrice it means *harder*, and *very hard*; B means *black*; HB, *hard* and *black*; and so on; FS signifies *fine stroke*.

The best drawing-pencils, as we have mentioned, are manufactured exclusively from the purest lead. We are rather puzzled at the distinction which most artists make between "plumbago" and "Cumberland lead." It must be a purely empirical difference, or more probably, a trade technicality. The substances are identical, and the proper mineralogical term is graphite. Should this distinction always hold good between an HB and a BB, for example, then we should be inclined to suppose that it is owing to the alloy or amalgam with which the graphite is always more or less mixed in the manufacture. In other words, a pure plumbago pencil is soft, and a mixed pencil is hard. With regard to the quality, we believe that the best can only be obtained from the Borrowdale lead. Indeed, Borrowdale lead, otherwise Keswick pencils, otherwise "crayons d'Angleterre," are held in the highest esteem by artists all over the world. When the name of a Keswick maker is stamped on a pencil, it may generally be depended on, which is more than we can say of certain well-known names in London. For very inferior pencils the worst quality of black lead is mixed with black chalk and size, or gum and water, and from this paste a pencil is made.

Great quantities of pencils are now made of a composition formed of sawdust and small pieces of black lead, which being ground to an impalpable powder, is mixed with some cohesive medium; for this purpose different substances are employed, some of which make a very inferior pencil; but others being united at a proper degree of heat, and consolidated by a strong pressure, make a pencil to answer for many purposes (especially where the writing is intended to be permanent), almost as well as the genuine black lead.

German pencils of a trashy quality but gaudy exterior, at one time threatened to occupy the market. But the Keswick people met them on their own grounds, and applying colour and varnish of equal quality to the sticks, beat them hollow by superiority of lead. Indeed, a German pencil, in our opinion, is something like a German violin—admirably varnished, and that is all.

Black lead, as well as being employed in the form we have been describing, is also reduced to little cylinders, and used in the form of ever-pointed pencils. Large quantities of these cylindrical leads are now produced at Keswick. This is entirely a fancy branch of the business; and as for the French artificial pencils, which consist, we believe, of finely-prepared clay, mixed in due proportion with black lead reduced to powder, and with various sorts of coloured earths, by which the variety and hardness of tint are produced, these cannot be said to belong to our present subject.

The first attempt at artificial pencils was that of a French gentleman named Conté. We may mention that they have always been very popular on the Continent, and have yielded the inventor and his family a large fortune.

The number of black lead pencils made in Keswick was computed for us at about 250,000 per week, that is about thirteen millions per annum. At an average length of seven inches, this would give us 1,436¼ miles of black lead and cedar—an original form of statistics, but quite admissible we suppose. Some of these pencils are worth 48s. per gross, and some are sold as low as eighteenpence per gross, a sum we have mentioned at which they were sold for each before the era of machinery. The cedar annually consumed amounts to something like 12,000 cubic feet, and the yellow pine in due proportion. We could not ascertain the value of the plumbago that is annually consumed; but it is partly the produce of the Borrowdale mine and partly from Mexico and Peru. The number of hands employed, including men, girls, and boys, in all, amounts to 200, and their highest wages vary from 15s. to 20s. per week. The gross sum of wages actually paid amounts to about 4,000*l.* per annum.

The trade has doubled, or nearly so, within the last twenty years; and, strange to say, it began to rise just at the very time we might have supposed it would begin to fall,—that is, when the Borrowdale mine was exhausted, and the local supply of the material had stopped. But the causes of this economical paradox are not far to seek; indeed they lie on the surface. In the first place, the manufacturers, although resident in the neighbourhood of the mine, had been accustomed to the mineral being supplied from London, and, as the foreign lead began to come into the market at about the same ratio in which the Borrowdale lead began to disappear, they really never felt the loss. From Borrowdale to London and back again must have cost as much, if not more, in land carriage than a shipment of lead from Mexico or the Brazils: and what did it matter to the Keswick manufacturers—supposing fair quality—where they obtained their supply of raw material. Since the cedar must come from Florida, they might as well bring the lead at the same time! The second cause must undoubtedly be ascribed to the improvement of the processes of manufacture by the introduction of machinery. Upon this we need not stay to insist after what we have tried to describe. A third cause,—although not of the same degree of importance,—may possibly be found in the increase of communication by means of railway with the north of England. But the primary cause, let us add, must be sought for in those genuine old English qualities of pluck and endurance,—the courage in facing difficulties, and the skill in surmounting them, which characterised the people of Cumberland before they discovered plumbago, and which we need hardly say still belongs to them after their plumbago has been exhausted. It is no light praise to say of these Keswick men that they have carried their produce into the very front ranks of European manufacture; but this praise they assuredly deserve.

Although not within our present limit, we cannot help adding a word as to the good effect the trade has exercised on the town of Keswick. Above all other towns in England, this little market-town is endeared to the people who visit it from its picturesque seclusion and its romantic beauty. A coal-field in the neighbourhood would have ruined it. A cotton manufacture would have been absolute perdition. Observe, then, the singular correlation—the principle of natural selection—which must exist between the town and its staple commodity. It has outlived all the other trades of the place—even though threatened itself with extinction. It employs the surplus population without demoralising and degrading them; and finally it contrives to exist without the aid of the tall chimneys and the sulphureous vapours which disfigure the beauty and destroy the health of our principal manufacturing towns.

THE ALKALI WORKS NUISANCE.

A PUBLIC document of considerable importance from a sanitary point of view has just been printed by order of the House of Commons. We refer to the Report of Proceedings under the Alkali Act, by the inspector, Dr. Angus Smith, of Manchester. Our readers will probably remember that an Act was passed in 1863 to compel the proprietors of alkali works to condense the hydrochloric acid vapours instead of allowing them, as hitherto, to pass into the atmosphere, to the injury of the health of the surrounding inhabitants and the destruction of the vegetation. We may state that it is in the preliminary operation of making soda-ash from common-salt, and which is carried out on an enormous scale in this country, that the hydrochloric acid vapours are given off. The first step consists in mixing the salt with sulphuric acid, by which sulphate of soda is formed, and hydrochloric acid is given off. So far back as 1836, Mr. Gossage, of Stoke Prior, near Worcester, and afterwards of Widnes, in Lancashire, a well known proprietor of chemical works, patented a method of condensing these vapours, by causing them to pass up a tower filled with silicious pebbles, fragments of brick, or coke, down which a stream of water was allowed to trickle. When the water arrived at the bottom, it was found to have absorbed the whole, or nearly the whole of the gas which it met with in its descent. The acid thus obtained is of course of some commercial value. In spite, however, of the success of Mr. Gossage's invention, and of the reminders which were continually administered to the proprietors of chemical works in the shape of costly actions for damage to crops, they continued, until the Alkali Act was passed, to vomit thousands of tons of acid from their chimneys.

The document now under notice deals with the results during 1865, and is the second of its kind. It shows a slight but decided improvement upon the first year. During 1864, the condensation of hydrochloric acid gas amounted to 98·72 per cent. over the kingdom, being equal to an escape of 1·28 per cent. In 1865, the average condensation was 99·1111, the average escape being 0·8889. Allowing 0·2 for an error, the inspector puts the figures at 98·9111 and 1·0889. Stated in this way, the escape appears perfectly insignificant; but when we remember that no less than 315,000 tons of salt are decomposed yearly, we shall not be surprised to learn that, even now, five tons of dry acid (equal to about three times that weight of acid as usually sold) pass off into the atmosphere. These facts are of some interest in connexion with the decay

of stone, but, as Dr. Smith has formerly shown, the rain water of all large coal-burning towns is very acid, about a thousand tons of vitriol being showered down on Manchester yearly. We had occasion to refer to his experiments a short time back in an article on the decay of stone.* The details will be found in the Report of the British Association for 1851.

The Alkali Act provides that in case 95 per cent., at least, of the hydrochloric acid gas be not condensed, the owner of the works shall be liable to a penalty of 50*l.* for the first offence, and 100*l.* for each succeeding infraction of the law. Although the escape has, in one or two cases, exceeded the permitted amount, the inspector wisely decided to take no action in the matter, as he was convinced that there was no intention to trangress, and that every effort was being made to bring the condensation up to the required standard. The Act has had one effect which was hardly anticipated by the manufacturers—the inspector has actually become a witness for the defence in cases of actions for damages brought by occupiers of land in the vicinity against the owners of alkali works. This has occurred in two cases, in both of which the plaintiff failed to obtain a verdict, mainly in consequence of the evidence of the inspector as to the perfection of the condensing apparatus.

On the whole the Act has been more successful than was anticipated, and we have got rid of one great nuisance. The system of condensation was in use in some works before the passing of the Act, so that it is not easy to say what quantity of hydrochloric acid was allowed to escape. We shall, however, be on the safe side if we assume that, of the 495 tons of acid which is now condensed every day, at least one half was formerly sent up the chimney-shaft. The Act, then, has prevented the daily pollution of the atmosphere with, say, 250 tons of a poisonous gas. Unfortunately, the law only will continue in force until the 1st of July, 1868, the duration being limited by a special clause in the Act. It is to be hoped, however, that it will be renewed.

Before quitting the subject, we desire to say a few words upon another manufacturing nuisance of gigantic proportions. The Alkali Act refers solely to works "for the manufacture of alkali, sulphate of soda, or sulphate of potash, in which muriatic acid gas is evolved." We beg to suggest that the Legislature should take copper-smelting works in hand next, and put a stop to the clouds of "copper smoke" which have converted the country round Swansea into a desert. Leplay, who wrote a valuable memoir on the copper-smelting processes of South Wales in 1848, calculated that 200,000 tons of ore were annually smelted in that district, 46,000 tons of sulphur being volatilized. The sulphur, combining with an equal weight of atmospheric oxygen forms sulphurous acid, so that in round numbers 100,000 tons of that compound were annually allowed to pass into the atmosphere. The value of the sulphur thus wasted was estimated by him at 200,000*l.* per annum. So far as we are aware, the copper trade of South Wales has not diminished since Leplay wrote, and Swansea imported last year, of *foreign* ore and regulus alone, the enormous quantity of 78,656 tons.

It must, however, be admitted, that the smelters have made several attempts to get rid of the nuisance. About forty or fifty years ago, Messrs. Vivian, the proprietors of the Hafod Works, expended about 6,000*l.* in this manner, but they were not successful. Mr. Greenfell, in 1848, spent about 2,000*l.* in the erection of condensing apparatus, which he placed under the direction of Schafhäutl, a distinguished German chemist, now professor at Munich.† This, too, appears to have been a failure. A few years ago, Mr. Bell took out a patent for the purpose of utilizing copper smoke, which he showed to Mr. John Williams, then head of a large copper-smelting firm at Swansea. He raised no practical objection to the process, but "concluded by saying that the copper-smelters' business was so profitable that they did not want any improvement in the trade, and as to the nuisance, they must do the best they could with it." He also applied to another large company at the time, "and was told the same story, that they did not wish to introduce anything new into the copper process." Within the last year or two, however, the subject has been revived by Messrs. Vivian, and, we believe, with some success. A patent was taken out in 1863, by Moritz Gerstenhöfer, for an improved furnace for roasting ores, which the inventor states has been used with much success at the Royal Saxon Sulphuric Acid Works. This patent was purchased, last year, by Messrs. Vivian, for 4,000*l.* and we understand that it has been very successful, a large quantity of sulphuric acid being now manufactured from the otherwise wasted sulphur vapours. The acid thus obtained unfortunately contains a large quantity of arsenic, which it is very difficult to remove profitably. There is, indeed, a large local demand for oil of vitriol, by the manufacturers of tin plate, but it is probable that the amount of impurity would be too great to allow of acid obtained from copper ores being used for such purpose. It admits, however of being employed for the manufacture of manure, and we believe that Messrs. Vivian are now erecting premises with this or a similar object in view.

In spite of all the evidence to the contrary, there are persons who believe, or who profess to believe, that copper smoke is not injurious. Dr. Percy, in his *Metallurgy*, quotes a Dr. Thomas Williams, who published a report on the subject in 1848, in which he attempts to show that the smoke is almost harmless. Against these views we may place the opinion of the men who are most interested in the question—the smelters themselves. Those who are acquainted with Swansea and the neighbourhood, will, we think, not need much in the way of argument.

The new Sanitary Act contains the following additions to "nuisances," as defined under the Nuisances Removal Acts:—"Any factory, workshop, or workplace, not already under the operation of any general Act for the regulation of factories or bakehouses, not kept in a cleanly state, or not ventilated in such a manner as to render harmless, as far as practicable, any gases, vapours, dust, or other impurities generated in the course of the work carried on therein, that are a nuisance injurious to health . . . . . any fireplace or furnace which does not, as far as practicable, consume the smoke arising from the combustible used in such fireplace or furnace, and is used, within the district of a nuisance authority, for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gas-work, or in any manufactory or trade process whatsoever." Mr. Cowan, the member for Newcastle, proposed to insert after "workplace" the words, "not being a smelting-house." The amendment was negatived, Mr. Bruce, who assisted to draw up the bill, stating that it was never the intention of the Government to interfere with copper-smelting works. When it was shown that any effectual means existed for the suppression of the noxious vapours from such works, it would be time enough to legislate upon the subject. The Bill also contains a saving clause, which provides that the magistrate may dismiss a summons if he be satisfied that "such fireplace or furnace is constructed in such manner as to consume, as far as practicable, having regard to the nature of the manufacture or trade, all smoke arising therefrom." Taking into consideration the careful wording of the Bill, it would be difficult to make it include copper smoke, which is, after all, not "smoke," in the ordinary acceptation of the word.

In conclusion, if Messrs. Vivian's experiments have been as successful as we have been led to believe, there seems no reason why the Legislature should not step in and compel other copper smelters to adopt a similar process. Not only will a large saving of valuable material be effected, but the health of the district will be improved, and the earth will again bring forth her increase.

* See p. 421, *ante*.

† Professor Schafhäutl has recently published a paper in the "Journal of the Munich Polytechnic Institution," describing his endeavours to introduce puddling machinery, which has been spoken of several times lately as a new invention. So far back as 1836, he took out a patent for a machine of this kind, which was tried at the Tividale Iron Works, near Dudley, then belonging to Mr. N. H. Solly, and with a considerable amount of success. Professor Schafhäutl states that Messrs. Dumény and Lemut's mechanical puddler is only an imitation of part of his machine.

ITALIAN NOTES.

Life in Florence is now so full of excitements, so varied by picturesque demonstrations and signs of generous public feeling, that it seems natural that all should be forgotten, save what connects itself in some way with the absorbing interests that affect a nation's destinies. Yet we are satisfied in being able to report of proofs given that Italy, whatever the effervescence and onward movement of the time, does not forget her past, nor intend to renounce the vocation by which she has won such honours; and that in her capital the local questions of improvement and embellishment are still thought of. If, in this respect, delays have been caused by great events, and means necessarily withheld for a period, none need be surprised; the fact reported (though not officially) being, that the accomplishment of all projects for enlarging this city is now suspended; that, at least, as far as authorities are responsible, nothing is to go on till present obstacles have been removed. The merely negative undertaking of what is to demolish, not create, indeed continues: the old walls along the northern side are fast disappearing, leaving the open prospect of villa-studded slopes, woods, gardens, and mountain scenery beyond; and the long line, now overstrewn with *débris*, enormous masses of rubble-work, &c., is destined eventually to become a pleasant boulevard, shaded by avenues, and no doubt one of the most attractive rendezvous for citizens on fine evenings. In a few days we are to see erect in the Loggia of Orcagna, where the requisite basement has been thrown up, the much-admired colossal group by Fedi, *Il Ratto di Polissina*, or "Pyrrhus and Polyxena," and another sculpture by the same artist, now become public property, thanks to the Prince di Carignano, who ordered it for himself some years ago, but has lately presented it to this city's magistrates, is the statue of "Tuscan Civilization:" a female attended by a little winged genius, with an oaken wreath and wings on her head; another wreath as well as a lyre in one hand, and in the other hand a stylus with which she has been writing on a scroll pendent over her lyre, this twofold historic record,—*Contegno del Popolo Fiorentino* 27 *Aprile*, 1859 (date of the deposition and flight of the last Grand Duke); 15 *Marzo*, 1860, *Voti per l'Unione alla Monarchia Costituzionale*, 366,571 (act of annexation to the Italian kingdom by universal suffrage with that immense majority). As to conception, this figure is accordant with the ideal and abstract nature of its subject, full and matronly in form, the countenance fine in type and serenely serious, the greater part in the nude, and, what drapery there is, very well treated. The municipal council, after voting thanks in proper form to the royal donor, ordered that competent persons should be appointed to decide as to the choice of a suitable *locale* for this statue—one of Fedi's happiest. Dupré has not yet begun the Cavour monument,—at least in any form visitors are allowed to see; and among his newest finished works the only one not noticed by us is a statuette of Giotto as a young man, so far superior to his *old* Giotto in the series under the Uffizi porticoes, that we may regret, both for the artist's and the public's sake, that the former cannot be raised to the place of the latter, presupposing, of course, its enlargement to the same size. Among the drawings by Italian masters in the corridor lately added to the Uffizi, we notice several with the indication, "From the collection of Santarelli," the well-known Florentine sculptor, who, at his own cost, and by dint of much exertion, procured this inestimable series illustrative of a highest period in this country's art, and has generously presented the whole to Government (or rather to the nation), with the sole condition that it should have a permanent place in that classic museum. The Belle Arti Academy has published its annual competition for Tuscan students. Only those under eighteen years are to compete in the school of the nude; those under twenty in that of architecture and ornates. The premium for all alike is to consist of a pension at 30 francs per month for three years.

Though the public works for the enlargement of the city are suspended, two great buildings that possess a certain claim to that character are still in course of completion; the one the Royal Stables, with immense front, rising beyond the walls at the side of the Boboli Gardens, and to have communication with them by private gateway; the other the Corsi Palace, or rather its façade, rebuilt, at the cost of 500,000 francs, after demolition of the former because of its very inconvenient projection into the line of a much-frequented street,—the latter, indeed, an imposing example of the modern palatial style.

Almost the last measure of the Parliament, on the eve of the great struggle, was that which condemned the monastic system for ever, and without exception; and on the 11th of July was published the decree to that effect, with the signature of the Royal Lieutenant, at the head of the Government during the absence of the King.

The first article is as follows: — "Religious orders, corporations, and congregations, regular or secular, as also conservatories and asylums, which impart the community-life, and have the ecclesiastical character, are no longer recognised in the State; the houses and establishments pertaining to such orders, corporations, &c., are suppressed." Then follow the terms of the provision made for individuals to be thus ejected from cloisters. All the staple property of the suppressed orders devolves to the State; but places of worship, together with all works of art, vestments, and sacred furniture contained in them, will be left intact, to be applied to the same uses as formerly. Books, MSS., scientific documents, archives, all objects valuable for artistic or antiquarian character, found in the monastic buildings, and not pertaining to their churches, will be transferred to the public libraries or museums in their several provinces by decree of the Ministry of Worship in accord with that of Public Instruction. One article that particularly refers to the more renowned establishments as to whose fate interest may be felt, and has lately been expressed, in distant countries, is as follows: "The Government will make provision for the preservation, with their premises, libraries, archives, objects of art, scientific and all similar instruments of the edifices of the Monte Cassino Abbey, of La Cavas,* of San Martino della Scala,† of Monreale, and the Certosa, near Pavia; also of other similar ecclesiastical establishments distinguished for monumental importance or for any aggregate of artistic and literary treasures." For the rest, the vacated buildings will be conceded to the magistracies of the provinces they are placed in, if demand be made before the end of a year, to be appropriated as public schools, hospitals, poor-houses, infant asylums, or for other purposes of beneficence and utility; those premises already destined for the care of the infirm or for public tuition to be assigned to the several communes in whose territory they stand. Under these regulations, therefore, will the ancient system, the institutions, so many of which had birth in this island, be swept away throughout the Italian kingdom before the last day of the year 1866!

AGGLOMERATED CONCRETES AND HYDRAULIC CEMENTS.

Coignet's agglomerated concrete, of which we have before now spoken, consists of a proportion of sand, a smaller quantity, perhaps a fourth, of lime, and a minimum quantity of Portland cement, say 1-15th, 1-20th, or 1-30th. Instead of mixing these ingredients with water, so as to form a mortar of ordinary consistency, a very small quantity only of water is added, and the mass is made to undergo a trituration of greater or less duration by means of special apparatus. By this trituration, notwithstanding the feeble quantity of water, a pulverulent mass is obtained which acquires by a more prolonged trituration the consistency of a firm plastic paste. It is then ready for the mould, into which it is introduced in successive and very thin layers, which are submitted to a powerful ramming process. This operation of compression effects such a complete agglomeration, that each cubic mètre and a half of sand and lime is made to occupy the space of only one mètre; and the lime, whose particles are thus mechanically brought into contact, becomes indurated with astonishing rapidity and intensity. A few days, in some cases hours, suffice for the mass to acquire the character of hard stone.

As the work of one day, with this concrete, unites perfectly with that of the preceding, it is plain that a mass of this species of masonry can be augmented indefinitely, so that a house, bridge, reservoir, or any other construction, can be made to form a monolith.

The most important building executed in agglomerated concrete is the church of Vesinet, situated in a park of the same name, near Paris.‡ It is of Gothic style, and the entire masonry forms a single block. The division of the naves is formed by piers of grouped colonnettes in cast iron; these, together with the cast-iron responds against the lateral walls, support the weight of the roof, which is of wrought iron. The concrete of which the walling is composed contains: river sand, 3 parts; earthy and ferruginous sand from Vesinet, 1 part; slacked lime, in powder, from Argenteuil, 1 part; heavy cement (*ciment lourde*), from Paris, ¼ part; cement forming 1-21st part of the whole.

Another advantage arising from the suppression of water, the energetic trituration, and the forced aggregation of the particles of lime, in these concretes, is, that a slight difference in quality of the lime effects but little the result obtained; therefore the nearest hydraulic lime at hand will serve the purpose; whereas, in other concretes, the best lime must be obtained, in order to secure a good mortar. In fact, M. Coignet presented to the Society of Civil Engineers in Paris specimens, capable of receiving a high polish, composed of the worst description of lime, even ordinary quick-lime, bad and marly sands, fine sea sand in impalpable powder unfit for common mortar.

With regard to the fact that, in masonry, mortars and concretes, when well made, are progressively and continually becoming harder, while cements do not acquire an increasing induration proportional to the energy of their original hardening or setting;—this may be explained by considering that cements contain very little free lime or oxide of calcium, being almost entirely composed of silicates formed by torrification at a high degree of temperature. Now, as pure lime has the property of absorbing, in order to pass into the state of carbonate, a quantity, nearly equal in weight to its own, of carbonic acid, it is plain that the more perfect a cement is—its perfection consisting in having but a trace of free lime—the less it will have the power of absorbing carbonic acid gas; whilst on the other hand the more a mortar contains of free lime, the more powerful and energetic will be the absorption, and the more the weight will be increased—that is to say, a cubic mètre of mortar containing 400 lb. to 600 lb. of free lime can absorb nearly 400 lb. to 600 lb. of carbonic acid, while a cement will absorb little or none.

This action of the carbonic acid of the air has a more striking effect upon agglomerated mortars and concretes than upon ordinary ones. In fact, it is easily understood that if to a compressed concrete like Coignet's, so dense that a cubic mètre contains 15 hectolitres of ingredients, with the particles so intimately blended by trituration, we add a new substance, carbonic acid, of equal weight with that of the pure lime, the increase of density of the whole mass will be enormous. Thus, the *bétons* agglomerated composed of 5 parts of lime in powder, weighing 55 kilogrammes the hectolitre, and ½ part or 1-12th of cement, yield in a few days an artificial stone resisting more than 20 kilogrammes of crushing force per square centimetre, while substances, composed of 1 part of the best cement and 2 parts of sand, cannot withstand 10 kilogrammes of the same applied force. For lime mortars or concretes to harden into the state of artificial stone, it requires much time.

Among the latest theories put forth by French engineers as to the cause of the setting (*prise*) of hydraulic cements, we may mention those laid before the Academy of Sciences in Paris, by M. Fremy last June. Vicat established beyond all doubt that the hydraulicity of a cement is due to a composition formed when limestone is calcined in presence of argil. He states that this composition is a double silicate of alumina and lime, which, in hydrating, causes the setting of hydraulic cements. MM. Rivot and Chatonay, in their important work on cements, state that the calcination of an argillaceous limestone produces aluminate of lime, the formula for which is Al^2O^3, 3 CaO, and also a silicate of lime, represented by SiO^3,CaO; these two salts, in contact with water, produce the two hydrates,

Al^2O^3, 3 CaO, 6 HO,
SiO^3, 3 CaO, 6 HO,

which become the cause of the hardening in question.

In both these two theories the hydraulicity of the cements is ascribed to a simple action of hydration, like the setting of plaster of Paris; but by M. Fremy another cause is assigned. This learned *savant* made extensive experimental researches on the properties and mutual action of four substances which, according to Vicat, Rivot, and Chatonay, constitute hydraulic cements. 1. silicate of lime; 2. silicate of alumina and lime; 3. aluminate of lime; 4. caustic lime, or oxide of calcium. The experiments are detailed in the memoir, which concludes with the following statement:—That the hardening of hydraulic cements is not due to the hydration of the silicate of lime, or that of the double silicate of alumina and lime; these salts *do not form any combination with the water*; that the setting of hydraulic cement is the result of two different chemical actions; 1. the hydration of the aluminates of lime; 2. the reaction of the hydrate of lime upon the silicate of lime, and upon the silicate of alumina and lime, which act in this case as pozzolana. The calcination of an argillaceous limestone cannot yield a good cement except when the proportions of argil and lime are such that these can be formed. In the first place, an aluminate of lime represented by one of these formulæ,—Al^2O^3, CaO; Al^2O^3, 2 CaO; Al^2O^3, 3 CaO: in the second place a simple or multiple silicate of lime, represented approximately by one of these formulæ,—SiO^3, 2 CaO; SiO^3, 3 CaO; and in the third place, pure lime capable of acting on the preceding pozzolanic silicates.

In the course of the memoir, M. Fremy states that when aluminates of lime represented by Al^2O^3,CaO; Al^2O^3, 2 CaO; Al^2O^3, 3 CaO are reduced to a fine powder, and slightly wetted, they solidify almost instantaneously, and produce hydrates which acquire in water a considerable degree of hardness. They have, moreover, the property of agglomerating inert substances, such as quartz, sand, &c.

M. Fremy mixed aluminate Al^2O^3, 2 CaO, with 50, 60, and even 80 per cent. of sand, and obtained a pulverulent mass which in water acquired the hardness and solidity of the best stone. The interest attached to these mixtures of aluminates of lime and silicious substances is the more important in a practical point of view when we consider that blocks are required to be produced capable of resisting atmospheric influences and the powerful effects of sea water. M. Fremy considers that the solution of the problem of constructions resisting the ravages of the sea, lies probably in the employment of concretes which are formed nearly wholly of silicious substances united together by a feeble proportion of aluminate of lime. On this point M. Fremy cites the excellent indications given by M. Coignet on the subject of agglomeration of cements, saying that he has himself borne witness to their importance and correctness.

Portland cements, according to M. Fremy, have no good quality unless they are produced at a very high temperature. The aluminates of lime have this character, also of not being able to solidify under water unless they have been exposed to an intense heat; thus they seem to be the principal agent in hydraulic cements of rapid setting.

Perhaps the inferiority of some of the Portland cements of commerce may be traced to want of sufficient intensity of heat in burning. M. Fremy made the aluminates of lime, for his experiments, with a blast furnace.

ARTERIAL DRAINAGE.

The two great questions of the day undoubtedly are, our water supplies and our means of drainage.

Touching the first, the only serious problem requiring solution appears to be the one of expense; for although the engineering difficulties in some cases are many and great, they are by no means insurmountable. The necessary supplies can invariably be obtained, where limits as to distance are not imposed. The water question, then, I venture to think, may fairly be considered healthy. The imperative necessity in all places of a copious and pure supply is rapidly over-riding all other considerations.

Not so with the sewerage question. That it has not yet sufficiently impressed itself upon the people at large, and even our professional men, as a stern necessity, may be inferred, I think, from the fact, that when any extensive and consequently costly scheme of drainage is proposed, a half apology is invariably implied, in the suggestions so often made, for the utilization of the sewage.

Here, I think, lurks a great error; and I cannot but earnestly wish that the press, and all our engineers, would exercise their skill and influence in pointing out the necessity merely, leaving the pecuniary part of the question to take care of itself. In all cases let us have the best scheme, irrespective of cost.

All who take an interest in this great question must have felt gratified when perusing, in your last week's issue, the paragraph entitled, "The

* Otherwise La Trinita, between Naples and Salerno.
† Near Palermo.
‡ For notice of this church, see *Builder* of November 26, 1864.

Don Valley Drainage." The proposition is comprehensive, and so replete with sound engineering and good sense, that sooner or later it must be carried out. I believe it is the first occasion upon which a well-defined scheme, combining the drainage of more than one town, has ever been proposed.

The valley of the Don, however, it appears to me, is not the only one, by scores, where a similar scheme could, and should, be carried out. The valley of the Trent I believe to be well adapted for such a proposition; and the necessity for the realisation of such will sooner or later force itself upon public attention.

All who are acquainted with the geography of our little island know, that the river Trent has its source at the foot of a hill in Cheshire, called "Mow Cop," a few miles to the north-east of the Staffordshire potteries, and that it flows through the populous town of Stoke, to which converges the whole of the drainage of the pottery towns; from thence, passing to the east of Trentham Hall (formerly it ran through the Pool), it flows onward in a rapidly increasing volume, past the small and not over-cleanly town of Stone, and, of course, receiving all the sewage the inhabitants do not elect to keep under their noses. We next find it at Rugeley, having previously received the waters of the Sow and the Penk, and into which flows the sewage of Stafford and Penkridge; it then flows onward to the great beer-mart, Burton, having previously absorbed the waters of the Tame, into which the refuse of Tamworth is discharged, and which, some time ago, was attempted to be made the channel for carrying off a portion of the drainage of Birmingham. Leaving Derby a few miles to the north, it then receives, at a place called Sawley, the waters of the Derwent, into which falls the sewage of Buxton, Matlock, Matlock Bath, Belper, Duffield, and Derby.

About one mile south-east of the Trent Station on the Midland Railway it is joined by the Soar, the receptacle for the sewage of Leicester (deodorized at an annual loss), Barrow, of hydraulic lime notoriety, Loughborough, and the extensive village of Kegworth. About one mile to the east of the said Trent Station it receives the Erewash, which carries off the drainage of a large and populous valley, containing the manufacturing towns and villages of Long Eaton, Toton, Sandiacre, Ilkeston, and Codnor Park, where are the celebrated Butterley ironworks. Our river next passes about one mile to the east of Nottingham, receiving, of course, the whole of its sewage, together with that of the valley of the Leen,—a valley as extensive and as densely populated as that of the Erewash.

From Nottingham the Trent flows to Newark, having been augmented by the Greet,—the outlet for the drainage of the pretty little ecclesiastical town of Southwell, immortalized by its minster. After leaving Newark, it receives (with the exception of the Idle from Retford) no stream containing sewage contributions until it reaches Gainsborough: and here, becoming broad, deep, and tidal, I will leave it.

Turning back, I should wish to point out, that from Newark to Lincoln, and from thence to Boston, there exists one almost dead level, of exceedingly light, sandy (and in some places, peaty) soil; with absorbing powers almost unlimited, and without one stream of water, excepting those of an artificial nature, for drainage purposes. This area is exceedingly favourable for a scheme of drainage, particularly as to its levels; for, whilst the Trent flows with a rapid current down to Torksey, there exist but a few feet of fall between Lincoln and Torksey. From Lincoln to Boston there is, I believe, a fall of 18 ft.

My scheme, in a few words, is to make one grand arterial drain or sewer, into which all the towns and valleys I have enumerated shall discharge their refuse.

In the vicinity of each town and village I would make it a covered drain; but in all other places an open one. Through its entire length, however, I would have it smoothly and substantially paved with terro-metallic blue brick, of the best quality. At suitable intervals, and as the districts rendered it desirable, I would provide flood-gates, and means for carting away the sediment. The details would, of course, be worked out upon exact engineering data.

Once in the valley of the Trent, there would be no lack of flushing power. Each spring and autumn, in their recurring courses, bring floods; and these would do the necessary work, and whilst cleaning the great artery add to the fertilizing power of these waters, where it might be considered advisable to render them available.

To those who know the valley of the Trent as well as I do, the scheme I propose will at once commend itself, as feasible and free from engineering difficulties.

The cost would be mainly incurred in the immediate neighbourhood of each town; deducting, however, the cost of pumping power, or settling tanks, and deodorising works, necessary in all isolated cases. I am confidently inclined to think that the scheme I propose would but little exceed in cost the aggregate of works contemplated for the towns I have mentioned, should they be executed independently of each other.

Were it advisable to point out, and make a prominent feature of, the application of the sewage, I can confidently affirm that few valleys offer greater facilities and advantages than the valley of the Trent. The soil throughout would profit by the sewage, and in some places peculiarly so. At intervals occur large areas and stretches of land containing many thousand acres each of gravel and sand-drift, thinly covered with mould. For such districts sewage could be applied without stint, and would be accepted and paid for as a great boon. So porous are these gravel and sand beds or drifts, that although immediately bordering the Trent, they are often in dry weather burnt up and comparatively valueless.

The wants of the tract of land lying between Newark and Lincoln I have previously alluded to.

To those who object to my scheme as visionary and Utopian, I would put the question, show us a way out of our difficulties? Birmingham, Nottingham, and Lincoln are already in a fix. We cannot continue to discharge our refuse into the Trent; that will not be tolerated much longer. The supply of water at Nottingham drawn from the Trent, at the Trent Bridge, has been this week unanimously condemned as impure and dangerous, and this in a great measure from sewage discharged into the Trent a little above what is known as the "Wilford Boat." Besides, the thing is monstrous, and a gigantic commercial blunder, to throw away so much valuable manure.

The difficulty is an increasing one, and overwhelmingly alarming to all thinking minds: already the population of the midland towns I have alluded to approaches very nearly to one million of souls, and undoubtedly will in a short time exceed those figures.

I will here leave my proposition, commending it to the consideration of all those who, like myself, are impressed with the unsatisfactory position of the drainage question, and who esteem human life of more value than gain.

Ignorant and selfish men, no doubt, will laugh and sneer, deriding my idea, and, shrugging their shoulders, congratulate themselves that they are not likely to be called upon to pay towards such a scheme. To such (viewing it as a life question) I venture in conclusion to suggest, that our gracious Lord and Master has unmistakably manifested His estimation of the value of humanity over all earthly things; and delayed as the serious consideration of this great question may be by the many, the time will come when human beings and human life will be esteemed of more value than silver or gold.

FREDERICK BAKEWELL.

MEETINGS OF COUNTY ARCHÆOLOGICAL SOCIETIES.

THE Kent Archæological Society held their annual meeting at Ashford. The proceedings commenced by a meeting in the Corn Exchange, under the presidency of Marquis Camden, K.G., who has since suddenly died. The Rev. J. P. Alcock, vicar of Ashford, commenced the proceedings by addressing a few words of welcome to the president, and the other members present. The report of the council was then read and adopted. The party afterwards proceeded to the church, of which a description and history were read by the Rev. A. J. Pearman.

The college was next visited, and Mr. Pearman also gave a short history of that building. An excursion was then made to Godinton, the ancient seat of the Toke family, and thence to the church of Great Chart. The weather unfortunately was unpropitious.

Dinner was partaken of in the old Corn Exchange. At the conclusion, the company adjourned to the new Corn Exchange, where a temporary museum was exhibited. Sir Walter Stirling presided at the evening meeting in the new Corn Exchange, at which a paper "On the History and Antiquities of Ashford" was read by the Rev. A. J. Pearman.

The evening concluded with a paper "On the Pilgrim path," which runs through this county, read by Mr. T. Thurston.

The programme for next day comprised an excursion by way of Boughton Aluph, visiting its church and the old vicarage house, past Godmersham Church, to the ancient fortress of Chilham Castle, which Mr. Charles Hardy had thrown open to the society for inspection. The Rev. R. C. Jenkins undertook to conduct the society over the remains of the castle.

On leaving Tremworth House, the company visited Olanteigh Towers, and the owner accompanied the visitors over his picture galleries.

The attendance on both days was very large, and facilities were afforded by the South-Eastern railway.

The Surrey Archæological Society's excursion took place on Saturday before last, under the presidency of Mr. Charles Buxton, M.P., when the following places were visited, viz.,—Slyfield Stoke D'Abernon church, Cobham church, and the King's House, Byfleet. Leatherhead station was the rendezvous, where conveyances awaited the members and friends.

The party partook of a collation at the Cobham schools provided for them by the president, and there were about 200 guests present. The papers read included one on Slyfield, by Mr. C. Baily; on Stoke D'Abernon Church, by the Rev. P. Parr Phillips; on Cobham Church, by the Rev. E. Loring, vicar of the parish; and on the King's House, Byfleet, by Mr. Buxton.

The Sussex Archæological Society held their annual meeting at Eastbourne; but the weather not being favourable, the meeting was an unusually small one. The proposed visit of the British Archæological Association to Hastings, no doubt also helped to diminish the attendance. The meeting, however, was sufficiently large to show the vitality of the society, and the interest felt in its proceedings. The party first visited the parish church of St. Mary, when Mr. G. F. Chambers pointed out the chief features of interest. The supposed Black Friars monastery and the ancient parsonage-house were then visited, and the Early English crypt beneath the Lamb Hotel; the various points of interest in all being explained by Mr. Lower, Mr. Chambers, and other gentlemen. The business meeting was afterwards held in the assembly-room at the Lamb Hotel, under the presidency of Mr. J. A. Hankey, high-sheriff of the county. A long paper "On Eastbourne" was partly read by Mr. Sax Bannister; but as it was resolved to print it, the remainder was left unread. In the afternoon the members and their friends met in the Cricket-ground, at a cold repast, in the society's marquee, the high-sheriff presiding, in the absence of the Earl of Chichester.

The Wilts Archæological Society have postponed until next year the general meeting which it was intended to hold at Chippenham this autumn. In lieu of the general meeting it is proposed to hold a *conversazione* in Devizes, in the course of the autumn, for receiving a report, electing the officers of the society, and other business, which will be followed by the reading of papers on divers matters of interest connected with the archæology of the county.

LOANS FOR THE ERECTION OF LABOURERS' DWELLINGS.

THE rules and regulations with reference to loans to be made towards the erection of dwellings for the labouring classes, under the 29th Vict., c. 28, have been printed. The applications are to be addressed to the Public Works Loan Commissioners through their secretary, setting forth the description and nature of the company or authority proposing to obtain an advance, accompanied by plans of the ground and of the proposed buildings, together with an estimate of the cost and a statement showing the proposed method of raising the difference between the loan and the estimate. The applicant is also required to give an undertaking that the houses are *bonâ fide* intended as dwellings for the labouring classes. "Parties to whom loans may be advanced will be required to enter into covenants to repair and insure for user (as far as practicable), by persons belonging to the labouring classes, and to submit to such by-laws as shall be approved by the Commissioners of

the Treasury, and to such inspection of the dwelling-houses from time to time, both as regards repair and conformity to by-laws, as the Commissioners of the Treasury may direct."

We congratulate the Treasury on the production of a sentence which would, we think, baffle the ingenuity even of a candidate for a junior appointment in the office.

Should the plans and security offered appear satisfactory to the Public Works Loan Commissioners, application is to be made through them to the Treasury for the sanction of the proposed loan, which will then be given, subject to the sufficiency of the title being established for the satisfaction of the Public Works Loan Commissioners.

The plans, specifications, and estimates will be submitted by the Loan Commissioners to the Board of Works, who will decide as to the suitability and sufficiency for occupation by persons of the labouring classes. All applications for instalments of advances are to be made to the Public Works Loan Commissioners, giving a certificate of the expenditure incurred and of the state of the works, which will be subject to the inspection of an officer of the Department of Works.

DOMESTIC ECONOMY.

Amongst the questions set under this heading, in the Society of Arts new Examination Papers, are the following:—

Describe a convenient and economical dwelling for a working man and his family, say of four children.

What circumstances would influence you in the choice of a dwelling-house?

Give advice concerning the selection and purchase of household furniture.

What are the effects, moral and physical, of over-crowded dwellings in town and country? What remedies can you suggest for these evils?

What occupations of the labouring classes in our towns do you consider the most healthy, and why?

Write a short essay on the most common habits injurious to health and strength.

How may hard water be rendered soft?

What are the advantages and disadvantages of an open fire-place? What precautions should be observed in the use of close stoves?

THE FALL OF A HOUSE IN HOLBORN.

An inquest has been held on the bodies of two persons killed by the fall of a house, No. 6, Ely-court, Ely-place, Holborn, on Wednesday in last week. A number of witnesses were examined, some of them stating that the proprietors had frequently been cautioned that the house was unsafe. This an Italian named Guanziroli, who is a Hatton-garden tradesman, said he especially did some sixteen months ago, when another of the houses fell, which has not been replaced. He noticed two cracks in the walls, and a beam propping up the house was rotten, and was removed without being replaced.

Mr. J. Clarkson, clerk to Mr. Porter, district surveyor of Holborn and East Strand, deposed that on the 5th of May, 1863, he had an interview with Mr. Guanziroli, whom he was in the habit of meeting. He said to witness, "I don't want to do anything unneighbourly, but what do you think of these premises?" Witness examined the walls, and told him that he did not think that it was a case to report to the Commissioners of Police. Witness had no recollection of seeing any cracks, or the strut placed against the wall. He did not think the parapet was seriously leaning over the wall. It was difficult to say how the building fell, but he thought the wall on the first floor above the level of the pin which was now standing, gave way and took the roof and ceilings with it. He did not think that the stack of chimneys first fell. Witness had no intimation from Messrs. Ledger & Clarke, the proprietors, as to the state of the house. He went over the other premises in Ely-court with the surveyor of the Commissioners of Police since the accident, and they determined upon putting up certain shores, but he would have no hesitation in sleeping at present in any of the other five houses in Ely-court. The timber of the house which fell was old, but the timber of a large number of houses in London was in as bad a state. The occupiers of the premises, had they been wise, would have reported the state of the premises. A house might fall down from some latent cause.

Ultimately the jury returned a verdict that the deceased persons were suffocated by the fall of a house, No. 6, Ely-court, Holborn, on Wednesday, the 15th inst., such fall arising from accidental causes; but they were of opinion that there had been a want of proper precaution on the part of Messrs. J. V. Clark & W. Ledger, in not replacing the strut which they removed sixteen months ago, and which strut was the support of the house that had recently fallen in.

COMPETITIONS.

Free Library, Birmingham.—By vote of the Birmingham Town Council, at their meeting on the 7th inst., the plans of Messrs. Bateman & Corser were adopted for the Free Library, Gostagreen. The architects invited to send designs were Messrs. Bateman & Corser, Messrs. Martin & Chamberlain, Mr. Bland, and Mr. Thomason. The latter had to forego the competition in consequence of ill-health, but designs were forwarded by the others.

Taunton.—The committee for building a new college for the West of England Dissenters' Proprietary School at Taunton, invited competitive designs from the following gentlemen, all of whom complied with the invitation:—Messrs. Wilson, of Bath; Tarring, of London; Joseph James, of London; Ashworth, of Exeter; S. Shewbrooks, of Taunton; and Messrs. E. Godwin & Crisp, of Bristol. They have awarded the first premium to Mr. James, whose design will be carried out under his superintendence; the second, of 50*l.*, to Mr. Shewbrooks; and the third of 25*l.* to Mr. Tarring.

THE TRADES MOVEMENT.

Manchester.—In consequence of a partial strike among the carpenters and joiners for a rise of 2s. a week in their wages, the masters have locked all out; and as the tailors are in a like position, several thousands of workmen have been thrown simultaneously out of employment.

Dewsbury.—There being a strike of masons here, threats and intimidation are being used to force workmen from their employment, and a prizefighter has been brought before the police magistrates and bound over to keep the peace, from having practised intimidation by using threats to a journeyman mason.

Tunbridge.—Nine of the English navvies who made a dastardly attack upon the foreign labourers on the Surrey and Sussex line, have been brought before the Tunbridge Bench, and five of them have been committed for trial at the Maidstone sessions. Messrs. Waring, Brothers, deny that they pay their foreign workmen lower than they pay Englishmen. They say that, being in want of more men than they can get, they are hiring all able-bodied men who present themselves, without respect to nationality. Most of their foreign navvies are Belgians, who, after paying their expenses in this country, find that they can lay by as much money as the whole of the wages they would receive in Belgium would amount to.

Newcastle-upon-Tyne.—The iron-workers are returning to their employment at a reduction of 11 per cent. on former prices. The workmen's union suggest arbitration, which the masters will not agree to.

THE BOSTON BATHS.

The corporation baths of this town have lately been thoroughly repaired and put in order, under the direction of the corporation surveyor, Mr. Wheeler. The baths and the grounds adjoining were laid out about three years ago, the funds being provided by some of the leading inhabitants of the town, who took the land on lease from the corporation. For the last ten years or more, owing to the death of some of the acting trustees, and others leaving the town, they have been entirely neglected and almost disused. On the expiration of the lease the land reverted to the corporation, who, considering the great advantage to the inhabitants of the town in having, at a small cost, access to both hot and cold salt-water baths, and in maintaining in good order the walks and plantations attached thereto, determined to maintain and repair them at the expense of the corporate funds. The result has proved more successful than was anticipated: great numbers of persons daily make use of them, and the receipts, so far as they have gone, promise to pay the annual expenses of maintenance and interest on the outlay.

The land on which the baths are built is about twelve acres in extent, and was originally a piece of marsh, covered daily by the tides. This was inclosed by an embankment, and the ground laid out in walks and planted, the reservoir for the baths forming an ornamental sheet of water. The baths consist of an open swimming-bath, 70 ft. square, to which a charge of 6d. is made for admission; another open swimming-bath, 100 ft. by 40 ft., free to the public; a ladies' swimming-bath, and a ladies' private cold bath, covered in; and five hot-water baths. The water is salt, and is taken into the reservoir from the river at the top of the tides, and allowed to settle before being used.

The swimming-bath has been paved with glazed earthenware tiles, made for the purpose by Messrs. Cliff, of Leeds; they are 9 in. square and 2 in. thick, with holes in the sides to admit two wooden pegs or dowels. Before laying the tiles, the bottom and sides were excavated to a depth of 6 in., and the space filled in with cement concrete, the soil being a quick silt. The bath is supplied with Macfarlane's patent cast-iron bathing shades. The hot baths have been fitted with a new boiler, and are heated by means of coils of pipes in the bottom of each bath, through which the steam circulates. This method has been adopted as the water used in the baths is salt, and to avoid pumping, which would be necessary if it were heated in the boiler, the reservoir being on a level with the baths. The charge for admission to the hot-water baths varies from 3d. to 1s.

The land immediately adjoining, about thirty acres in extent, is the property of the corporation, and it has been proposed that this should be converted into a public park and recreation ground; a proposition which there is every disposition on the part of the corporation to carry out as soon as their funds will admit. This will be a great boon to the inhabitants, as there is not a single acre of open space in the borough that can be used for public exhibitions or amusements.

NEW POORHOUSE FOR SOUTHAMPTON.

On the 7th instant the foundation-stone of this building, about to be erected from the designs of Mr. T. A. Skelton by Messrs. Bull & Sons, contractors, was laid by the mayor of Southampton, Mr. S. M. Emanuel.

The whole of the buildings are to be erected with red bricks, the front block, containing the board-room and offices, facing St. Mary-street, being relieved with stone dressings. The second block, containing the master's residence, is also to have stone dressings, and is surmounted by a stone cupola, which serves the double purposes of lighting and ventilating the staircases and corridor of the building. The style of the designs is Italian. The other buildings are to be plainly and substantially erected, and ornamented with moulded bricks, cornices, &c.

The accommodation provided is for 518 inmates; each class having its work and day rooms, such as carpenter's shop, oakum shed, laundry, &c.; and in addition to the above is the nursery, the separation, or disorderly, and vagrants' wards, and the refractory cells conveniently placed near the porter's rooms at the entrance, the entire establishment being provided with its chapel, board-room, and clerk's offices, waiting-rooms, master's office and residence, matron's rooms, dispensary, vaccine-room, and porter's residence, together with dining-hall, kitchen, scullery, boiler-house, stores, &c.

The general arrangement is based on the advantage of placing the main blocks of buildings, north and south, with their windows east and west, so as to afford a fair amount of light and air to each room, and to have no dwelling-rooms with a northern aspect only. This arrangement, by compelling the separation of the building into several blocks, facilitates the classification and subdivision of classes of inmates.

The infirmary comprises three floors. It is arranged on the plan recommended by the com-

mission appointed to inquire into the construction of military hospitals, 1861, which requires the blocks of buildings to be placed north and south, with the windows facing to the east and west.

The amount of space recommended by the above commission is 1,200 ft. to 1,500 ft. cubic space for each inmate, while the minimum required in sick wards by the Poor Law Board is only 500. The space shown on the plan is 66 ft. superficial, and 790 cubic feet each inmate.

The wards are to be heated by open fireplaces, and ventilated by the tripartite windows.

At the banquet that followed the ceremony, some ill-feeling was excited *pro* and *con.* by charges of non-attendance on cholera patients by ministers of the Established Church. If the charge had been true, it was not a nice time to make it.

THE CONNEXION BETWEEN WATER AND CHOLERA.

The Registrar-General in his last report, says:—

"There are seven districts in the east: the mortality by cholera in the poor district of Shoreditch was at the annual rate of 4, by cholera and diarrhœa 8, in 1,000; five of its sub-districts are supplied by the New River, one partially, and one wholly by the East London, probably from Lea Bridge. In the rest of the east districts the mortality by cholera was at very different rates; it was at the rate of 39 per 1,000 in Bethnal-green, 50 in Mile-end Old Town, 60 in St. George-in-the-East, 70 in Whitechapel, including deaths in the London Hospital from other eastern districts, 70 in Poplar and Bow, and 80 in Stepney. Bethnal-green is one of the poorest districts of London, if we may judge by the annual value of the houses; but the people of Bow and Poplar are not conspicuous for poverty. The whole of these districts where the mortality from cholera was from thirty to forty fold higher than it was either in the west or the central, in the north or the south of London, were supplied with water from the Old Ford reservoirs. London is divided into 37 districts; six districts are supplied from Old Ford, and every one has been ravaged by the epidemic; the other 31 districts have for six weeks in succession suffered slightly. The 37 districts are subdivided into 135 sub-districts; 21 are supplied with the same water, and have all suffered six weeks in succession; 115 sub-districts have suffered inconsiderably, except in St. Botolph and a few other districts, where the same water has crept in, and the mortality is partially swollen. By the doctrines of chances it is impossible that the coincidence between this particular water and the high mortality should be fortuitous in 135 cases, during six weeks in succession. The induction extends over all the area of observation in previous epidemics, where sewage water has so often led to cholera outbreaks. The persistence of the epidemic in the east London districts is no proof that the supply of the company is *now* worse than that of other companies, as its effects on the place and on the population only subside slowly. This great lesson should be taken to heart by every water company and every community in the kingdom. Unclean water cannot be consumed with impunity; its consumption is the sin of which cholera is the punishment."

RAILWAY MATTERS.

The South London line of the Brighton Railway has been opened for public traffic, it having been officially inspected by the representative of the Board of Trade, and reported to have been satisfactorily completed. The South London places a large suburban district in immediate railway communication with the great system of the Brighton and South Coast Company. It is a line intended to run from London Bridge to Windsor, passing through Rotherhithe, Old Kent-road, Peckham, Peckham-rye, Denmark-hill, and Loughborough-park (Brixton), and thence on to Victoria. The portion completed and open for traffic is nearly nine miles in length, and extends as far as Brixton. There are stations at each of the places named. At London Bridge (where there are three lines of rails) the new station is large and commodious. Along the line are some heavy works, including several bridges with rather extensive spans. At present it is proposed to run trains every twenty minutes throughout the day. The fares are about the same as those charged by the omnibuses running in the districts. All the trains are first, second, and third class. The line was formally opened in the presence of Mr. Craven, the engineer, and other officials of the line.

The Cannon-street Station of the South-Eastern Extension will be opened on the 1st of September. The bridge, station, signalling apparatus, &c., have been examined and reported upon favourably by Col. Yolland, of the Board of Trade. This station has nine lines of rails, and five platforms of great width, one of them having a double carriage road for exit and entrance. The signal-box at the entrance to the station extends from one side of the bridge to the other, and has a range of sixty-seven levers, coloured yellow for distance signals, red for in trains on the east line, blue for out, and black for points.

The station has six rows of globular lamps. The segmental roof is wider in a single span and longer than the roof of any other building in London. At the inner corners of the station there are to the right the station-master's offices, and adjoining them the bullion office, which will be furnished with a large strong safe from Chubb's. At the opposite corner there are refreshment-rooms, booking-office for local traffic, &c. The principal booking-offices and waiting-rooms, with the entrance and exit to and from the station platforms, are, as at Charing-cross, on and through the ground-floor of the hotel. The nine lines in the station are reduced to five lines in crossing the bridge.

The Cannon-street Station is 350 yards from the Bank of England, 300 yards from Cheapside and Cornhill, 750 yards from the General Post-office, and about 600 yards from St. Paul's. It is expected that trains will run between Cannon-street and Charing-cross at intervals of about five minutes. The Strand will thus be greatly relieved, both as regards vehicles and pedestrians.

THE GROSVENOR HOTEL, CHESTER.

The Grosvenor Hotel, at Chester, which forms the subject of our illustrations, was opened to the public in the beginning of the year: it occupies an important situation on the north side of the Eastgate-street, one of the principal thoroughfares of the city, and includes the whole space between the city walls on the east and Newgate-street on the west.

The site was previously occupied by the Royal Hotel and various shops and premises, which were removed for the construction of the present hotel.

The whole of the buildings have been executed at the cost of the Marquis of Westminster, his lordship, together with Earl Grosvenor, having shown great interest throughout their erection. The style of architecture (somewhat in accordance with the existing buildings of Chester erected in the latter end of the sixteenth and commencement of the seventeenth century) was arranged by Earl Grosvenor with the late Mr. Thomas M. Penson, and this character has been maintained throughout.

The "Row," which is peculiar to Chester, and which existed in the former buildings occupying the site, had to be preserved, and forms one of the principal features in the Eastgate-street front, the superstructure being carried on a colonnade formed of polished Anglesea marble shafts, with moulded stone bases and carved and moulded capitals, and which support a series of wrought-iron (box) girders and stone lintels. The general face of the work is of red pressed bricks, the jambs, mullions, sills, and heads of windows, and all external angles, being composed of Bath stone.

The upper stories of the Eastgate-street front, and a portion of the return front in Newgate-street, present externally the appearance of a timber construction with plaster panelling, the gables being decorated with moulded and perforated verge boards, surmounted by wrought-iron finials. The external timber-work throughout the other portions of the buildings, is more sparingly introduced, being for the most part limited to the gables, the general face of red brick and Bath stone being continued.

The angles of the principal building are terminated by turrets, resting on stone moulded corbels; the upper parts of the turrets are made in conformity with the timber framing of the fronts, with which they range, the roofs being covered with lead, carried up a considerable height above the eaves cornice, and are terminated with wrought-iron finials painted and gilded. At the corner of the Eastgate-street front next Newgate-street, the lower part of the angle turret is treated in a distinct manner, a corbelled panel being brought out to receive the Westminster Arms, which are carved thereon in high relief: the upper part of the panel in front contains the name of the hotel and date of erection.

The principal entrances to the hotel are from the Row, in Eastgate-street, and by a recessed colonnade, of similar construction, in Newgate-street, this latter being principally intended for the use of the assembly-room, and is in close proximity to a stone staircase, and promenade corridor attached to the same.

Entering from the Row, through a vestibule and glass screen, are the hall and principal staircase, 45 ft. by 24 ft., with the bar immediately facing. The principal rooms on the groundfloor are the coffee-room, 40 ft. by 24 ft. 6 in.; commercial-room, 32 ft. by 20 ft.; smoking-room, 23 ft. by 15 ft.; billiard-room, 44 ft. by 24 ft.; and other smaller sitting-rooms; there are also bar parlour, still-room, washing pantries, plate-room, &c. &c. The kitchen is 36 ft. by 24 ft., fitted with cooking-ranges of several descriptions, hot closets and tables; and the scullery adjoining, 26 ft. by 17 ft., contains steaming apparatus and ovens and ranges; there are also spacious larders, pantry, &c.; also servants' hall, brushing and cleaning rooms, and all other suitable offices necessary for the working of a large establishment; all approached by spacious corridors and passages well lighted and ventilated.

Ascending the principal staircase (of York stone moulded steps and landings), the main first-floor landing is reached, and from thence the whole extent of the building may be traversed by spacious continuous corridors, from which proceed the several staircases communicating with the upper floors. The principal rooms on the first floor are the Westminster, or ladies' coffee-room, 32 ft. square; the assembly-room, 34 ft. by 68 ft.; refreshment or supper room, 36 ft. by 30 ft., with large serving-room adjoining; there are also numerous sitting and bed rooms, bath, store, and linen rooms, housemaids' room, coal and dinner lifts, and all other conveniences.

The second and third floors and the attic floors are chiefly occupied by bedrooms and the necessary requirements of a large hotel.

Large cisterns are provided on the attic floor for an ample supply of water, and hydrants are fixed in various parts of the premises on ground-floor as a security against fire.

The middle of the site is occupied by a large central court, affording light and air to the buildings which encompass it. This court is laid out as an ornamental garden, having a spacious ornamentally tiled and flagged ambulatory around, and at the centre of the south end of the court is an enriched clock turret and gable, springing from a stone shaft and impost. The clock has an illuminated face, and may be readily seen from the greater portion of the rooms.

In a detached building are situated commodious wash-house, laundry, and drying-room, with steam-boiler apparatus for supplying the washing-tubs, boiling clothes, &c.

Immediately adjoining the main hotel, and forming part of the hotel buildings, is the tap, which is in itself a distinct and perfect establishment, having separate entrances, hall, bar, bar-parlour, public sitting-rooms, kitchen, scullery, and all suitable offices, with bed-rooms on the first and second floors, together with all requisite conveniences.

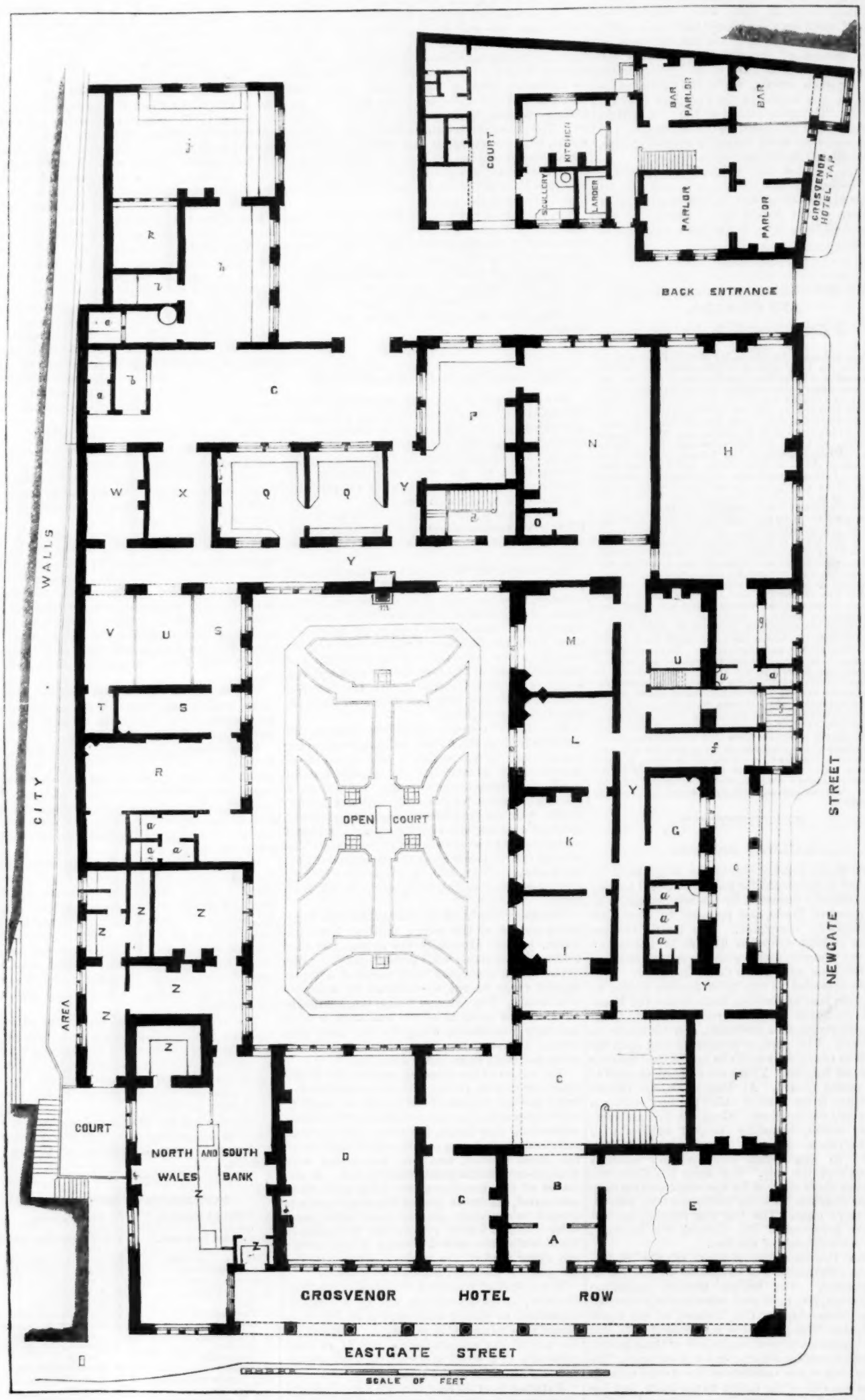
On the opposite side of Newgate-street, facing the hotel, are situated the stables and carriage houses, having large open yard and spacious sheds, together with residence for the superintendent: the stables are spacious and airy and have fittings of a very superior description; harness, saddle, and cleaning rooms are also provided and furnished with the best and most modern contrivances for carrying on the work of the establishment. The lofts are also very commodious.

The works at the hotel and offices attached, and the tap buildings, have been carried out under several contracts, by Mr. Thomas Hughes, of Aldford, builder; the stable buildings and residence attached were contracted for, and have been executed by, Messrs. B. & O. Owens, of Chester, builders.

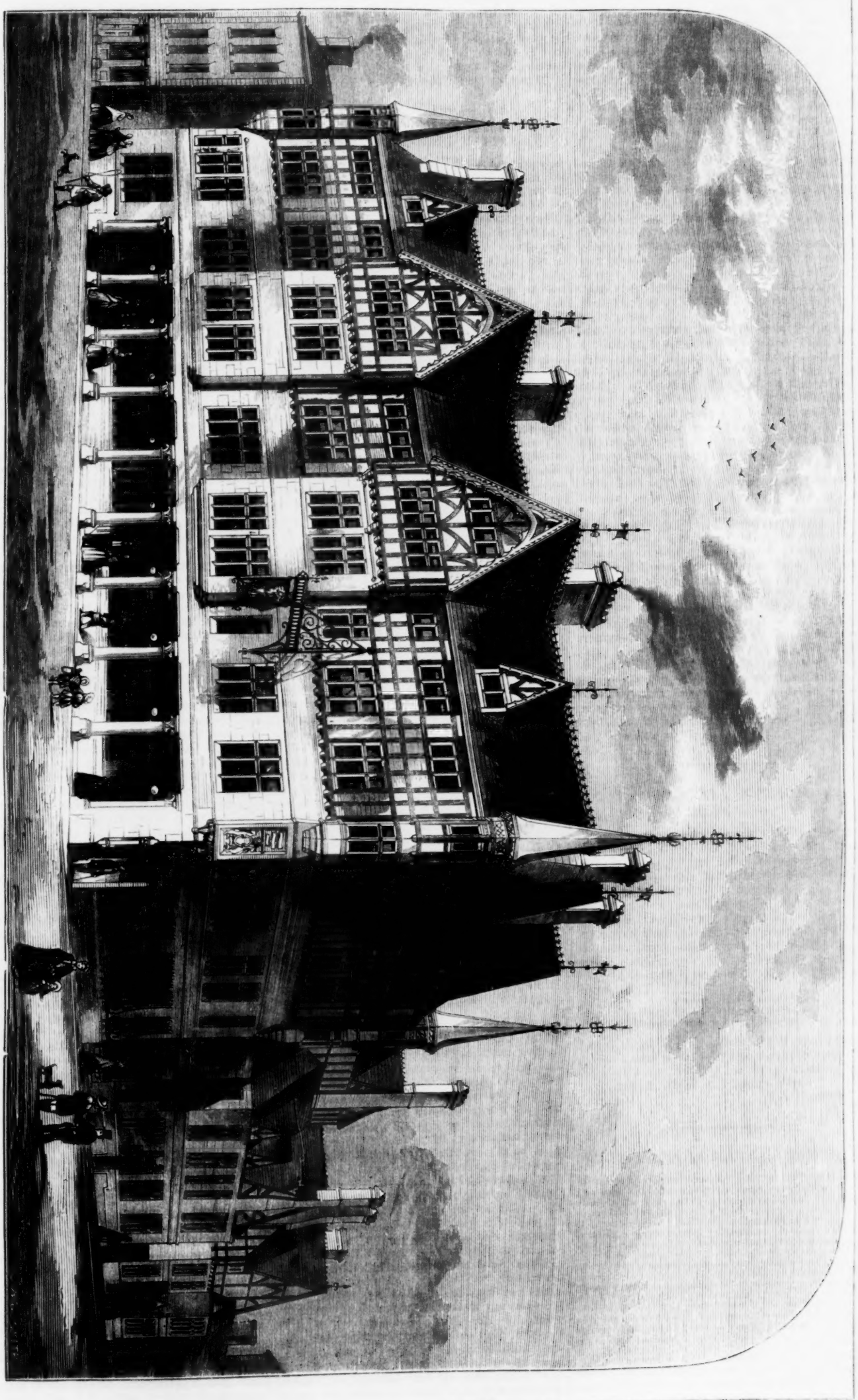
The whole of the buildings have been erected from the designs and under the superintendence of Messrs. Penson & Ritchie, of Chester, architects.

REFERENCES TO GROUND PLAN.

A. Principal Entrance.
B. Lobby.
C. Hall and Staircase.
D. Coffee-room.
E. Commercial-room.
F. Smoking-room.
G G. Sitting-room.
H. Billiard-room.
I. Bar.
K. Bar-parlour.
L. Still-room.
M. Plate-room.
N. Kitchen.
O. Dinner-lift.
P. Scullery.
Q Q. Larder and Pantry.
R. Servants'-hall.
S S. Brushing-rooms.
T. Luggage- and Coal-lift.
U U. Commercial Luggage.
V. Boot-cleaning.
W. Porter's-room.
X. Coals.
Y Y Y. Corridors and Passages.
Z Z Z Z. Bank Premises.
a. Water-closets, Lavatories, &c.
b. Ashes-place.
c. Kitchen-court.
d. Staircase to First-floor.
e. Entrance to Assembly-room, &c.
f. Staircase to Assembly-room.
g. Kitchen-entrance.
h. Washhouse.
i. Laundry.
k. Drying-room.
l. Steam-boiler, &c.
m. Illuminated Clock.



THE GROSVENOR HOTEL, CHESTER.



THE GROSVENOR HOTEL, CHESTER.—Messrs. Kyrke Penson, & Ritchie, Architects.

LECTURE BY LORD RUSSELL.

At the fifth annual meeting of the Devon Association for the advancement of Literature, Science, and Art, held at Tavistock, Earl Russell delivered an address, in which, as already mentioned by the press, he reviewed the subjects of science, literature, religion, and politics, declining to treat of art in what his lordship called its native soil,—the county which produced Sir Joshua Reynolds.

On the general subject of science in which, he said, he had availed himself of aid afforded him by an eminent scientific friend, his lordship thus addressed his audience:—

The progressive improvements and refinements in the analysis of light since the time of Newton have recently led to an unexpected insight into the material constitution of the sun and the other great light-giving bodies of the universe, viz., the fixed stars. High microscopic power, subtle mechanical adjustments of the prism, and an apparatus for polarization of luminous rays, have, in combination, led to the detection of the characters of substances which in a state of incandescence emit the rays of light. Thus knowledge has been gained into the metallic constitution of the sun, and of some of the brightest of the fixed stars.

Our own time has seen some of the most interesting applications of chemistry combined with advanced knowledge of the nature and power of light which it is possible to conceive: I allude to the solar pictures called photographs. Every year sees some new and important improvement in this great discovery. Thus pictures, in which the most delicate details are faithfully preserved, are printed from the electrotype plate obtained from the photograph. The details of the illuminated surface of the moon are obtained with wonderful accuracy, and a photograph of Jupiter has been taken, in which the belts of cloud are well marked, and the satellites are distinctly shown. This science, on a wing that never tires, has pursued her flight from the days of Galileo to our own time, losing nothing that she has acquired, but always adding new realms of knowledge to her former conquests. Returning to photography, it is curious to observe that the photographic eye is more sensitive than the living one; it can receive and register impressions too fine for human vision until increased light and new agency have improved our perceptions. Photography is now an indispensable servant in important meteorological records. Again, the engineer at home can ascertain, by photograph transmitted by successive mails, the progress, brick by brick, plank by plank, nail by nail, of the most complex works on the Indian railways. The physician can register every change of physiognomy in mental malady. The emigrant may carry with him miniatures such as neither Denner nor Gerard Dow would have equalled in their details, of the persons and scenes with which his dearest memories are entwined. Photography is also important to our social relations by giving new facilities to the officers of justice for the detection of criminals.

The most valued, perhaps, of the generalisations of science in the present century are those of the conception of force as being centred in points of space, not in points of matter; of the principle of the conservation of force; of heat, light, electricity, magnetism, galvanism, chemistry, as being modes of force; and, finally, of their universal convertibility into one another. Remote as such profound conceptions and subtle trains of thought seem to be from the needs of daily life, the most wonderful and astounding practical augmentation of man's power has sprung therefrom. The material advantages to be derived from Oersted's experiments with his small magnets, voltaic pile, and bits of copper wire, seemed hardly appreciable; yet from these, and the discoveries springing from these phenomena, has come the electric telegraph. The philosopher, indeed, foresaw such an application of his newly-discovered power of converting electricity into magnetism. The inventive faculty of Wheatstone gave us the application. On the 6th of August, 1858, the laying down of upwards of 2,000 nautical miles of telegraph wire, connecting Ireland with Newfoundland, was effected; and on that day was sent, in thirty-five minutes, the following message:—"Glory to God in the highest: on earth peace and goodwill towards men." The president of the British Association at that time most justly observed,—"Never since the foundations of the waters were laid could it be more truly said, 'The depths of the sea praise Him.'" That success was not lasting; but again, in 1866, the month of August has witnessed the transmission of messages between the Queen of the United Kingdom and the President of the United States, which augur, I would fain believe, "On earth peace and goodwill towards men."

GRANTHAM TOWN HALL COMPETITION.

In reply to advertisement for designs, the cost of building, with stoves and everything, not to exceed 6,000*l.*, six designs were sent in, of which three have been referred to a gentleman to be named by Mr. G. G. Scott, to report as to the cost, &c. A correspondent objects, beforehand, that each of the designs selected would cost more than the sum named, and urges that, should the referee so report, the council should, as a matter of course, fall back upon one of the *plainer* designs submitted. "If," he says, "the council intended to have had an ornamental building, they should have named a sum in their conditions which would have allowed of an ornamental building being erected. But when any of the competitors, complying with their requirements, take the council at their word, and produce a *plain* building, it is a breach of faith to overthrow their designs for those whose only superiority consists in their being more elaborate and costly than the others. I trust that the council will adopt the line of conduct I have endeavoured to point out, and which I am sure the profession generally will endorse as being the only right one."

CHIEF CONSTABLES AND THE SANITARY ACT.

Sir,—Having observed in one of the recent numbers of the *Builder* an elaborate review of the Public Health Act of 1866, in which you attach much importance to the 16th clause, which gives to chief constables power to interfere for the prevention of nuisances, with the sanction of the Secretary of State, I beg you to reflect on the very uncertain position of chief constables, and the danger of being dismissed from their situation if they venture to interfere with the duties of their employers; for town councils, boards of health, nuisance committees, &c., are the persons who appoint and control chief constables, and those inhabitants who seek to set a chief constable over a nuisance authority are not his friends, for his term of office would be very short under such circumstances.

I believe it is not your rule to insert letters of this description in the *Builder*, but if so, perhaps I am not asking too much if I beg that in your editorial capacity you may be disposed to insert a few remarks, so that the public may learn the truth, and our rulers in framing laws see the difficulties surrounding the Act of Parliament in question. Observer.

WHAT IS A RIVER, AND WHAT ARE ITS USES?

A river is the drain of a hilly district, which carries the water that falls from above, or that which springs from beneath, along the low grounds till it empties it into the sea. The quality of the water depends partly on the nature of the ground through which the rain filtrates to nourish the springs, and partly from the surface over which the redundant water flows before it reaches the river. Rain, as it descends from the clouds, is pure distilled water, and will readily absorb any soluble matter with which it comes in contact: in passing through the earth it partakes of the nature of the soil, whether it be chalk, clay, iron, or any other: in passing over the surface it absorbs the salts from decayed vegetable or animal substances, which it holds in solution, and from which it cannot be separated except by distillation. Water is thus said to be hard or soft in proportion to the quantity and nature of that which it holds in solution; when the rain falls more rapidly than the soil can absorb it, it acts as a natural scavenger, washing away all the impurities from drains, cesspools, ditches, &c., and drives all such matter into the river, where they become mechanically mixed, or, as it is generally termed, the water is made muddy. These grosser particles can be removed by filtration, which is nothing more than sifting, just as broken earthenware, oyster-shells, &c., are separated from ashes at a dust-heap. Having now seen what a river is, let us consider what are its uses. Its waters convey fertility to the valleys, and furnish food to plants from the impurities which it has brought down from the water-shed of the adjacent country; it supplies canals with the means of transport to merchandise; it furnishes power for grinding corn, &c. Are we, therefore, justified in making use of the water of a river for the supply of drink to the inhabitants of our towns and villages? Let us take one example. The river Lea rises at a small village in Bedfordshire, called Leagrave; thence it flows to Luton, a manufacturing town, of about 20,000 inhabitants, the liquid from the sewers of which, after being deodorized, fall into the Lea; it then passes through an agricultural district to Welwyn, Hertford, Ware, Broxbourne, and finally enters the Thames. One of its tributaries, the Mimram, rises at Whitwell, and after receiving the drainage of a tan-yard, passes on to its junction. Another tributary receives the drainage of Walkem, a considerable village. Thus, four towns, many more villages, and homesteads, send forth their refuse by the river Lea to the vicinity of London. Can such a stream be a proper source for water-supply to the inhabitants of any part of London? Filtration may make the water clear, but it does not remove the impurities which it holds in solution. Whence, then, can water be obtained for the great metropolis? Any one acquainted with a chalk district can testify to the amazing quantity that may be procured from wells sunk deep into the chalk formation; a number of these sunk a mile or two apart would furnish a very considerable supply. Let any person examine the natural springs at Ashwell, on the Royston and Hitchin Railway, the source of the River Cam, or inquire at the Hitchin Railway-station, where the whole water-supply to the engines of the Great Northern Railway is obtained from a well, and he will then form some idea of the treasures of good water which the chalk contains. It might be worth consideration whether two kinds of water might not be supplied, viz., spring-water for drink, and river-water, which is softer, for cleansing purposes. As a very small proportion of the water is drunk, sufficient might thus be obtained without fetching it from the mountains of Wales. N.

THE MONUMENTS, WESTMINSTER ABBEY.

Observing in your report of Mr. Westmacott's Lecture on the "Sculpture in Westminster Abbey,"* the inference made by that gentleman that the figure of a female, with a cross beside her and a dragon at her feet, among reliefs in the chapel of St. John, may be meant for the Blessed Virgin, I venture the suggestion that it may more probably be St. Margaret, whom legends represent as slaying a terrific dragon by virtue of the holy symbol. See Wordsworth's sonnet on the Worship of Saints—

> "St. George, whose flaming brand
> The dragon quell'd, and valiant Margaret
> Whose rival sword a like opponent slew."

Though it is, in fact, a cross, not a sword, that is often given to her in art as the instrument of her mysterious victory, as in a picture by Guercino at S. Pietro in Vinculis, Rome.

Florence. C. J. Hemans.

NUISANCES IN SOUTH LAMBETH.

Sir,—While the new Sanitary Acts are occupying some little public notice, it is not, perhaps, out of place to call attention to what, as it is the most lasting, is also as common and as dangerous a nuisance as any existing, and in some districts (this parish at least) as difficult, if not more so, to get the vestry to attend to. They take fifteen days to serve a notice; the notice lasts twenty-eight days. They then (taking their former rate of proceeding), in fifteen days more serve another twenty-eight days' notice; and, if this be not attended to, they may possibly, in fifteen days more, arrange to do something themselves within twenty-eight days from that time. This, the surveyor tells me, as a parishioner, is the most rapid rate they can move at, viz., 129 days to remove or remedy a nuisance that would carry off every inmate in the house in less time, perhaps, than they take to get them to move at all in the matter.

The nuisance itself is this: the old cesspool and the old well are left with the old pipes all perfect to the kitchen

* See p. 591, *ante*.

sink, while some jobbing bricklayer, not understanding the business, lays a new drain (just over what was an excellent well) into the next house, and so it runs off no one knows where. The rats soon open a way to the old drain-pipe, which is covered with a little mortar at the end only. Presently come wet weather and autumn, when all the wells are replenished, and the cesspool and well (by this time as foul as a cesspool) are charged with water from the land-drainage, forcing out the foul gas generated during the summer. The weather getting colder, you cannot leave all your windows open; and in this state you must exist, according to the vestry and their surveyor, for a period of four months, the landlord refusing to do anything but enforcing his rent rigidly. Can the tenant, under the circumstances, help himself?

The lawyers and a County Court Judge say No. Is it not the duty of a landlord to do what the law says he shall do, until he is compelled by a proper authority? The tenant must lie quiet and be poisoned,—he has no rights in the matter. If this really be law, it is time it was altered.

In other districts I am told the vestry serve a seven days' notice under such circumstances, when, if it is not attended to, they take the matter in hand themselves: this is as it should be. W. M.

*** Under the new Act, another "authority" may be appealed to.

BUILDERS' CLERKS' BENEVOLENT SOCIETY.

Sir,—It affords me great pleasure to see the kind notice you have taken of the above Institution, also of those gentlemen who form the committee.

I have read with great interest the notes and correspondence in your valuable paper appealing for interest and support, which I sincerely hope will be responded to.

Being a Builder's Clerk's wife, I well know that as a class we require some funds to fall back upon in the hour of trouble. Should sickness, accident, or death overtake us we should be left totally destitute: after being brought up in a superior position it would be indeed painful. Our means do not exceed 100*l.* per annum, with which we have to keep a respectable appearance and support and educate a family. My husband's energies are required from early in the morning until late in the evening, and this is unceasing, without the least change or recreation: with a superior education, he has to plod on for less money, in fact, than a mechanic. Surely we feel the need of help.

I am not acquainted with the founder of the above Society, but, I must say, he deserves all our thanks and gratitude for the warm interest he has taken; and I hope that those who are blessed with ample means will contribute to the support of this cause, and that you will kindly continue to give your interest to the same.

The Wife of a Builder's Clerk.

ROCK CARVINGS IN IRELAND.

Sir,—I am sure you will allow me to offer a few remarks on your review, in the *Builder* of July 14th, 1866, of a paper of mine, published in the last quarterly journal of the Kilkenny Archæological Society, explanatory of carvings on a natural rock-surface, at Ryefield, county of Cavan.

It is difficult for any one to estimate the true character and value of any rude carving or inscription without having seen the original; and while I admit that it is just possible that children may have made some of the smallest and most fresh-looking simple cross-shaped scrapings on the surface of the Ryefield stone, those markings which are deeper and more complicated, are most unquestionably of high antiquity, as many of them were completely obscured by a thick coating of lichen, and were only discovered during the process of carefully scraping the surface of the rock.

I admit that the only thing which invests these carvings with real interest is the fact, that similar markings, produced by similar means, are seen on some of the carved stones forming the sepulchral chambers on Sleive-na-Caillighe, in the county Meath. But is not a most important archæological fact thus established? and how can we tell its bearings on other facts yet to be discovered? All the great truths of science or research have been established by the accumulation of separate facts truthfully recorded.

You cannot, I think, suppose that the Sleive-na-Caillighe crosses, enclosed in lozenges or rude squares, are, or could be, the work of idle children, when the cist in which they occur had, until very lately, been buried beneath its original enormous tumulus of broken stones.

If you will refer to my original letter on the explorations of the tumuli on Sleive-na-Caillighe by my friend Mr. Conwell, published in the *Meath Herald* of October 21st, 1865, a copy of which I now enclose, you will see that the carved work in the chambers of the tumuli consists of three kinds—punched, chiselled, and scraped work; the last being proved to be the most recent, as it is observed occasionally to overlie the other two. The scraped-work patterns are invariably *rectilinear*, in distinction to the others, which are *curvilinear*. No one can for a moment doubt the extreme antiquity even of the latest of these decorations or devices; and if we find similar patterns produced in a similar way on a natural rock surface, we may fairly claim for the latter an antiquity equal or approximating to the former. How, therefore, any attempt to compare the two primitive devices with a view to proving their identity of age or design could appear "odd" to an archæologist, I am at a loss to understand, though you thus express yourself in the review to which this letter refers.

The carvings on the stone from the cist on Sleive-na-Caillighe have, as I have just shown, a distinct bearing on the carvings from the rock surface at Ryefield, as they prove that the latest of the sculpturings on such pagan sepulchral chambers apparently synchronise with those on this exposed rock surface.

I can assure you that in all the devices at Sleive-na-Caillighe, New Grange, Dowth, &c., there is not one at all resembling either of the diagrammatic figures given in your review of my communication to the Kilkenny Archæological Society at page 522; and to imagine for a moment that the "arborescent figure" at New Grange is made up of a series of VVV, one placed beneath the other, but not touching, as implied in your remarks, is so totally at variance with the plain fact, and is so calculated to mislead the purblind "architects of theories," that I, as an archæological "hod-man" or "carrier of facts," must entreat of you to dispel this illusion; and with this object in view, I at once send you a rubbing of this fern-like device from New Grange.

With regard to your supposition, that "many of these pre-historic records" (such as the tumuli in Sleive-na-Caillighe) "may relate to a time contemporary with the people whose traces have been found in the glacial drift," I can assure you, on the best geological evidence, that such an idea cannot for a moment be entertained. I have found that many of the exposed rock surfaces on the summit of Sleive-na-Caillighe, like that of Ryefield, bear *glacial striations;* and any iceberg passing over such a surface, which at the time must have been submerged beneath the sea, and leaving such scorings on the rock, would have swept away all such superficial structures as these tumuli, and left a polished and striated rock beneath the spot where they stood.*

The fabricators of the rude flint hammers, whose remains are now entombed in the gravels of our glacial age, long ceased to exist ere the green hills and valleys of the British islands were traversed by the fabricators of our megalithic structures.

In one of the cists of a chamber in one of the tumuli on Sleive-na-Caillighe, Mr. Conwell discovered a vast collection of bone flakes, or long leaf-shaped knives, and many of them were decorated with small engraved circles and parts of circles, grouped in various patterns. In every instance the centres of the circles were defined by a minute dot; and it was amongst these relics that *the leg of a diminutive pair of compasses, with an iron point, was discovered.* Archæologists, therefore, who are not of the school of "theoretic architects," will not fall into any error in allotting to its correct place, or estimating the true value of such a discovery.

I believe it is unquestionable that one of the groups of carvings at Sleive-na-Caillighe is an Ogham inscription, but the so-called Ogham from New Grange is of very doubtful character; of this I also send you a rubbing.

Geo. V. Du Noyer.

* New Grange is about 150 ft. and Dowth Cairn 260 ft. above the sea. When the glacial drift passed over the South of Ireland, these localities were from 1,500 ft. to 2,000 ft. beneath the level of the sea.

THE MAPLIN SAND SCHEME.

The second annual general meeting of the Metropolitan Sewage and Essex Reclamation Company has been held, Lord Warren de Tabley in the chair. The report says,—

"The directors are happy to state that the tedious and expensive works connected with the junction of the company's sewer with the main outfall sewer of the Metropolitan Board of Works; the passage across the Barking marshes, underneath the navigable tributary to the Thames known as the Barking Creek; the crossing of the Tilbury and Southend railroad; and the first pumping station at Five Elms, have all been authorised, and the work is being carried forward by the contractor in a very satisfactory manner. In order to demonstrate the truths of statements made before Parliament and elsewhere, that Maplin sand irrigated by sewage would produce luxuriant crops of grass, the directors caused upwards of 3,000 tons of sand to be brought up in barges from the Maplins, taken from a spot about a mile and a half out to sea, and spread 2 ft. deep over an acre of land at the outfall reservoir at Barking Creek. The plot was spread in the early part of March last, was sown with Italian rye-grass on the 14th April, and was fertilised exclusively with sewage. The first cutting was made on the 20th June from a portion of the acre, which was again cut on the 17th July; and the grass, exhibited at the Essex Agricultural Show on that day, representing as it did only twenty-seven days' growth, weighed at the rate of 14 tons an acre. Another portion of the sand plot, which was cut for the first time on the 7th July, weighed at the rate of 16 tons to 20 tons an acre. With the further object of proving the value of sewage, the directors have leased a farm near Barking, to which an iron pipe is now being laid in advance of the main culvert, and they hope very shortly to show the Essex farmers that, by laying out a moderate portion of their land for irrigation, they would not only derive a profit from the increase in their stock (which seven or eight annual cuttings of grass will enable them to make), but they would have the opportunity highly and profitably to manure the remainder of their land worked in the ordinary manner."

The report was unanimously adopted, and other business of the company transacted.

FIRST CASES UNDER THE NEW SANITARY ACT.

At Clerkenwell, Mr. Frederick Barlow, the owner of No. 41, Payne-street, Copenhagen-street, Islington, was summoned before Mr. Barker, to answer the complaint of Mr. William Mayes, inspector of nuisances and sanitary inspector on behalf of the vestry of the parish of St. Mary, Islington, under the Sanitary Act, 1866, on the ground that they are so overcrowded as to be dangerous to health. Mr. Layton, solicitor and vestry clerk of Islington, said that these were the first proceedings that had been taken under the Public Health Act, an Act to amend the law relating to the public health, and which received the royal assent on the 7th of the present month.

Mr. William Mayes, sanitary inspector of Islington, stated that on Tuesday, the 14th inst., he, in company with Dr. Ballard, inspected the house, 41, Payne-street, and found it to be occupied by five families. In the two kitchens there were one man, one woman, and four children; in the front parlour there were one man, one woman, and four children; in the back parlour one woman; in the first floor front one man and three children; and in the back room on the first floor there was one woman. From the first floor a woman was taken out ill and died. The average of air for each of the occupants of the kitchens and the parlours was 180 ft., and the minimum allowed was 300 cubic feet. The house is filthy, and the stench from the front parlour was fearful.

The magistrate said that this was downright cruelty to the poor persons in the house. He should impose a penalty of 20*s.*, and order the defendant to pay 1*l.* 3*s.* costs. If the defendant was brought here again for the same offence the full penalty would be imposed.

Mr. Layton said that by the 36th section of the new Act, where two convictions against the prisoner of any act relating to the overcrowding of a house, or the occupation of a cellar as a separate dwelling-place, shall have taken place within the period of three months, whether the persons so convicted were or were not the same, it shall be lawful for any two justices to direct the closing of such premises for such time as they may deem necessary, and in the case of cellars to empower the nuisance authority to permanently close the same in such manner as they may deem fit at their own cost.

We must applaud Mr. Layton, Dr. Ballard, and the authorities for the energy they are displaying in improving the sanitary condition of Islington.

The Henry-street houses at Islington are also in a shocking state in every respect as regards filth and defective water supply, drainage, privies, &c., as well as general disrepair and dilapidation.

CASES UNDER METROPOLITAN BUILDING ACT.

Projection of Shop Fronts.—Mr. Hammer, builder, of Greenwich, was summoned to the Greenwich police court by Mr. John Whichcord, the district surveyor of Deptford, for erecting wall to shop front projecting more than 10 in. beyond the external wall of house No. 11, High-street, Deptford, contrary to section 26, part I., rule 2, of the Metropolitan Building Act, which provides that, "In every street or alley of a width greater than 30 ft., any shop front may project 10 in. and no more, and the cornice may project for 18 in. from the external wall and no more."

Mr. Whichcord informed the magistrate that the work complained of was the projection of a new shop-front about 3 ft. from the original front of the house, and that the adjoining houses on one side were in a line with the original front of the altered house; whilst the houses which adjoined on the other side projected 3 ft. farther into the street, and were in a line with the new shop-front now complained of. He objected to the work on the ground that the Act provided that in the case of a street, like the High-street, Deptford, which was of a greater width than 30 ft., a shop front may not project more than 10 in., whereas the building then under consideration projected 3 ft. from that which was, and which on the first and second stories of the house still is, the original external front wall.

Mr. Arthur Harston appeared for the defendant, and stated that he was the architect under whose direction the alterations were being made, and further that there ex-

tended along the whole front of the house an enclosed forecourt 7 ft. wide, which projected into the paving of the street, and that after the building of the new shop-front now complained of there still remained a width of 3 ft. of enclosed ground belonging to the house; and he contended, firstly, that this was not originally, and is not now, a house or building in a street, inasmuch as there was and is now an intervening space of land, several feet in width, between the front and the street, and that, therefore, the section did not apply. Secondly, that inasmuch as the projected shop-front has new brick walls and front piers in continuation of the original party walls of the thickness and otherwise in accordance with the regulations prescribed by the Act, the faces of the new piers at the ends of the new walls must be construed to mean the external wall intended by the Act; and that the term "shop front" applied only to the modern portion of the vertical enclosure of the shop, which in this case did not project from the new brickwork more than the 10 in. allowed; and, in proof of this argument, he adduced that the Building Act of 1844, which was repealed by the Act now in force, contained a similar clause, differing only in having the term "face of a wall" instead of the present term "external wall;" and that the alteration in the clause was made with a view of allowing similar projections to the one complained of, where they did not encroach on the public way or beyond the general line of buildings. He also called the attention of the magistrate to the case of Morgan v. Hesketh, in which the official referees under the repealed Act disallowed the objections of a district surveyor in a similar case.

The Magistrate observed that the case before him was an objection under a clause contained in the Metropolitan Building Act, which regulated the construction of buildings, and had no reference to the line of frontage, upon which question the district surveyor had no jurisdiction, but which was regulated by the Metropolis Local Management Acts under the direction of the Metropolitan and District Boards of Works. He was of opinion that the clause under which the proceedings were taken only applied to houses abutting on streets or alleys; and inasmuch as the building under consideration had a space of land between it and the street, the section did not apply. It would be unreasonable to construe the Act into preventing an owner of property from bringing forward an addition to his house without reference to the relative position of the same to the public way, or its distance therefrom. The summons was, therefore, dismissed.

COMPETITION EXTRAORDINARY.

THE directors of the Cookham Bridge Company, having advertised in our columns for designs for an iron bridge, 100 yards long and 20 ft. wide, received thirty-seven plans and estimates, the lowest of which was 1,900*l.*, the highest 27,000*l.*! The tender of Messrs. Pease, of Darlington, was accepted, at 2,650*l.* The premiums for the two next best plans were awarded to Messrs. Peto & Co., and to Mr. John Pinchbeck of London.

METROPOLITAN WATER SUPPLY.

THE existing water companies appear to be on the move towards an improvement of their supply. Surveys, it is said, are in progress with a view of applying to Parliament in the ensuing session for an Act to enable existing companies, or some of them, to procure a better supply. It is proposed to divert and utilise all the sewage of the towns which lie on the Severn above Tewkesbury, in accordance with the principles laid down in the report of the Rivers Commission, 1865, and to take the supply from that river just above Tewkesbury, and convey it thence to large reservoirs at a distance of nine miles, and at a sufficient elevation to allow the supply to pass from these reservoirs to London, delivering the water there at the requisite height to afford a constant supply at high pressure to every portion of the metropolis. It is said that the flow of water so far, without receiving any contamination in its passage, will so oxydize the organic matter held in suspension that it will tend greatly to purify and soften the water; but if in close pipes or aqueducts, however large, this seems doubtful. The estimate of the probable cost of carrying out this undertaking, as made by the engineer, Mr. Hamilton Fulton, is 3,000,000*l.* Should it upon further investigation be found impracticable to divert the sewage satisfactorily from the towns above referred to, it is considered that a pure supply for London might be obtained from the sources of the river Wye, which drain the districts in the vicinity of Plynlymon range, where the annual rainfall is equal to 70 inches deep. Mr. Fulton estimates the additional cost of this plan at 2,500,000*l.*, or a total of 5,500,000*l.*

If the sewage of the towns on the Severn is to be diverted from that river, might not the sewage of the towns on the Thames, which is nearer home, be as well diverted from that river, and two useful purposes for London served at one and the same time? Or if there be any fear as to the diminution of the quantity of water in the river, is there not the same fear with respect to the Severn? But would not the fear in either instance be groundless? Water from mountain lakes, however, would be far preferable to river water.

In reply to a question in the daily papers as to why the Grays Water Company have not brought their spring water into the east of London, Mr. Alfred Smee says:—

"It is true that the South Essex Waterworks Company have a surplus of from 6,000,000 to 10,000,000 gallons of pure spring water per day, which is now running to waste in the Thames, and which this company is most anxious to supply to the east of London.

As soon as this project was under discussion the East London Water Company made large reservoirs, at great expense, at Tottenham, to catch the water of the river Lea. Surely, however, the time has passed, when, under our present water-closet system, rivers should supply our towns with water.

The question really is, ought the people of the East of London to be supplied with pure spring water, or shall they continue to be supplied with water of the Lea, mixed with the sewage of Waltham, Epping, Hertford, and the villages on its banks?

* * * * * *

The London water companies have been thought to enjoy a monopoly too powerful to be interfered with, and capitalists up to this time have feared to tackle the question with them. I can state officially that the pure spring water of Grays would have been supplied to the east of London before this time if the necessary funds for laying its mains could have been provided.

* * * * * *

The company invites the co-operation of the Boards of Health of parishes at the east of London, with the view to utilise these springs and lessen the spread of the cholera poison."

A meeting of delegates from metropolitan parishes, called to consider the best means of obtaining a Sunday water supply for the metropolis, has been held at the Vestry-hall, Upper-street, Islington, Mr. Harvey in the chair. The delegates present were from Plumstead, Mile-end, Chelsea, Kensington, St. George's-in-the-East, Bermondsey, Clerkenwell, and Southwark. Mr. Layton (vestry clerk) read replies from the following water companies to the application of the delegates;—East London, Grand Junction, Southwark and Vauxhall, New River, Lambeth, Chelsea, Kent, and the West Middlesex. *Only one company*, the Grand Junction, stated that they would lay on a Sunday supply. The other companies agreed to a temporary supply in poor neighbourhoods, but argued that there was not sufficient reason shown for employing their servants on Sunday. The East London Waterworks Company agreed simply to comply with the Act of Parliament. After a discussion, the following resolutions were unanimously agreed to:—

"That the companies supplying the metropolis with water be immediately invited to send, on Thursday, October 4th, at twelve o'clock, a representative or representatives to the Vestry-hall, Islington, to meet the delegates of the metropolitan vestries and boards of works, and at the meeting it be urged—first, for an immediate supply of water on Sundays; and, secondly, for a constant supply for the future: and that in the meantime a second and peremptory application be made, under the present threatening circumstances, for an immediate and general Sunday supply.

That in the opinion of this meeting no reform in the water supply of the metropolis will be complete until the Legislature compel inhabitants of towns and villages on the banks of the Thames to cease polluting the water of the same."

PROVINCIAL NEWS.

Romsey.—The old building used as a Town-hall at Romsey being too distant from the place, and likewise insufficient in size to meet the increased requirements of the town, a new one has been completed, and formally inaugurated. It has been erected in the Market-square, from the designs and under the superintendence of Mr. A. Bedborough, of Southampton, architect. The front of the building is in the Italian style. It consists on the ground floor of a council-chamber or magistrates'-room, two reading-rooms,—one for the town and another for the use of a reading society,—library, County Court offices, with judge's jury, and witnesses'-rooms, and above these the registrar's-room, with living and sleeping apartments for the attendants. The Town-hall, which is on the second floor, is 62 ft. long by 34 ft. wide, and 22 ft. high, lighted by day with a series of plate-glass windows. The dressings of the building are of Bath stone, and the principal front is faced externally with red brick. Mr. Dallimore, of Fareham, was the builder. The cost of the building has been about 4,500*l.* The Treasury contributed 1,500*l.* towards the cost.

Stourport.—The Town-hall, which has recently undergone considerable alteration and improvement, has been opened with a vocal and instrumental concert. The alteration consists of an enlargement. The public room is double its former size, it being now 60 ft. long, and 23 ft. broad, and is fitted up and lit with gas. In addition to this there is a large committee-room, reading-room, library, and class-room. The market-hall, in the base of the same building, has been renovated and fitted up with stalls, seats, &c. The cost of the alteration is 650*l.*

Birmingham.—Alderman Phillips having purchased from the Corporation for 18,000*l.* the land at the corner of Worcester-street, has entrusted to Messrs. Bateman & Corser, architects, the erection of nine retail shops, with three stories of offices and other rooms over them, in the Italian style. The workmen have commenced. The cost of the buildings will be 10,000*l.* or 12,000*l.* The property was gradually acquired by the Corporation, the negotiations for it extending over a period of at least three years. The freehold interest of Mr. J. B. Payn was purchased for between 10,000*l.* and 11,000*l.*, and that of the Free Grammar School for nearly 9,000*l.* Mr. Whittaker was awarded 5,000*l.* for his interest in the Fountain Inn. The Corporation were also obliged to purchase the leasehold interest of Messrs. Jones, Turner, Greaves, and Boucher, so that the improvement in that part of Worcester-street and New-street, if great, has also been expensive. The other improvements in contemplation or in progress in New-street are,—the erection of the Masonic Hall (Messrs. Briggs & Sons, contractors, at about 20,000*l.*), in progress; a new bank for the Midland Banking Company, opposite the Exchange, at a cost of 30,000*l.* or upwards; and the alteration, scheduled in the Improvement Act, at the corner of New-street and High-street. A Mr. Phillips claims 30,000*l.* for his freehold interest in the property required by the Corporation at that corner. The tenants would also have to be compensated for leasehold interest and loss of business. Mr. Phillips's claim has been submitted to arbitration.

Bradford.—A new building has been erected in Cheapside, immediately adjoining the County Court, the "home" of the "Bradford Club." The architects are Messrs. Lockwood & Mawson. The building is in the Venetian Gothic style. The principal front is towards the new street intended to be cut from Cheapside, but there is a front towards Cheapside with a bay window. The entrance is in the middle of the building, towards the new street. The hall is lofty and well lighted, and the floor is paved with encaustic tiles of subdued colours. From the entrance hall admission is obtained to the coffee room, which occupies the whole length of the building fronting to Cheapside. This room is 56 ft. by 25 ft., and the "bay" commands nearly the whole length of Cheapside. The first floor is reached by a staircase, the balustrades of which are of carved oak. On this floor the principal apartment is the billiard-room, in which two oak tables are now being fitted. Fronting to Cheapside is the reading and writing (or "drawing") room, 25 ft. by 38 ft.; and next to this again, a private dining-room, 25 ft. by 18 ft.: and again, in the immediate vicinity, a card-room, 10 ft. by 12 ft. The smoking-room communicates with the billiard-room, and is 12 ft. by 20 ft. On the upper floor there are ten bed-rooms. The contractors are:—Masonry, Messrs. J. Burnley & Son; joiners' work, Messrs. J. Wilson & Son; plastering, Mr. B. Dixon; plumbing and glazing, Mr. Walton; slaters' work, Messrs. Hill & Sutcliffe; and painting, Messrs. Briggs & Mensforth. The cooking apparatus has been put in by Messrs. Byrne & Co. The club consists of more than 200 members.

CHURCH-BUILDING NEWS.

Strensall (*Yorkshire*).—A new church has been opened at Strensall, near York. The edifice has been erected from designs and plans prepared by Messrs. J. B. & W. Atkinson, of York, architects. It is dedicated to St. Mary, is built in the Early Decorated style of architecture, and consists of a nave and chancel, with a tower surmounted by a spire at the west end of the fabric. In length the nave is 45 ft. by 21 ft. 6 in., and the chancel is 24 ft. long by 15 ft. 6 in. wide. The height of the spire surmounting the tower is 80 ft., and the square of the tower outside is 12 ft. 6 in. The porch is on the south side of the church near to the tower, and the vestry is situated on the north side of the chancel. The nave is divided into four bays, and the curved ribs supporting the roof rest upon stone

corbels inserted in the walls. The roof is open timbered, and its apex is 36 ft. in height from the floor. The walls outside are of stone from Bradford and Whitby, and the edifice is covered in with Westmoreland green slates, the ridge of the roof being crested. There are three bells in the tower, and a clock will also be placed in it, the gift of Lady Mary Thompson. The windows of the nave are of two lights each, with trefoil heads, and the west window is of the same character. The chancel is lighted with lancet windows, and the east window is of three lights. At present it is glazed with plain glass, but it will be filled in with stained glass by Mr. Knowles, of York. The subject is the "Adoration of the Magi," and the window is now in the York Exhibition. The other windows are filled in with cathedral glass, and have coloured margins of blue and ruby. The sittings in the nave are of deal, with shelves for prayer and hymn books. They are open, and stained and varnished in the same style as the rafters of the roof. The pulpit is placed in the north-east corner of the nave. The church is heated by a stove sunk below the nave floor. The church will seat 200, and it has been built at a cost of 1,300*l*. The architects were Messrs. J. B. & W. Atkinson. Mr. Dennison executed the carpenter and joiner's work; Mr. J. Hebden has done the masonry; Mr. S. Prudames, Low Ousegate, has filled in the windows with Cathedral glass, and executed the plumbing work; Mr. Jennings has carried out the plastering; Mr. Thomas Wood the slating; Mr. Alfred Lee the staining and varnishing; and Messrs. Fryer & Sons the heating apparatus. The architects and contractors are all of York.

Appleton-le-Moors.—An early English memorial church has been erected, at a cost of 10,000*l*., at Appleton-le-Moors, fourteen miles north of Malton, in Yorkshire. The building was designed by Mr. J. L. Pearson, of London. It comprises a nave, 37 ft. long and 15 ft. wide, with narrow north and south aisles, making the whole internal width 32 ft. 3 in. The chancel is 24 ft. 5 in. long, and of the same width as the nave, and has a circular apsidal east end. It is fitted up with stalls for the accommodation of the clergy and choir, and is lighted with five stained-glass windows, inclosed by an arcade of plain arches. Under this arcade is a reredos of Caen stone, divided into two compartments, the upper containing various emblematic figures, the lower a representation of the Last Supper, all executed in red incised work. The tower stands at the east end of the south aisle, and is 14 ft. square externally, and surmounted by a spire of pyramidal form. On the opposite side of the chancel, and at the east end of the north aisle, is a small mortuary chapel, in memory of the late Mr. Shepherd, ornamented with panels of incised work, and lighted with lancet windows of stained glass. An arcade of three plain arches opens into the aisles on either side, which are lighted with pointed windows of stained glass. There is also a circular window in the west gable. The seats, which are made of oak, are quite open, and will accommodate about 200 persons. The benefaction includes a parsonage, school, and schoolmaster's residence.

Leighton Buzzard.—The new church, North-end (chapel of ease) is progressing rapidly. It will be called St. Andrew's, and will contain 500 free seats. It is built of red sandstone, dug on the ground, with Wilts Farley Down stone dressings; 99 ft. in length by 54 ft. in width. The cost will be nearly 3,000*l*., chiefly raised by voluntary contributions, Col. Hanmer, lord of the manor, giving the land on which it stands. The architect is Mr. Joseph Neale, of Bristol; the builders are Messrs. Garside & Holdstock, Leighton; the stonework is by Mr. John Greenway, of Linslade, Bucks; the clerk of the works, Mr. J. P. Stephens.

Eton.—The foundation stone of a new church has been laid at Eton Wick, in connexion with the college. The site selected for the building adjoins the National Schools.

Maldon.—The contractor has been taking down the old pews in All Saints' Church. The columns stand out in all their original proportions, with their bases exposed, instead of being buried halfway up the shafts. The sedilia, double piscina, crypt, and arcading at the western end, are interesting, but the incised stones, without one exception, have been emptied of their brasses. Some of these stones, from the design of the matrices, seem to be very ancient. Two tables on brass only remain; but these are simply inscriptions, and date from the middle of the seventeenth century,—one of which brasses, in memory of a lady, characterises her as "The most lovinge spouse of *Elisa* Garington." The stone over the grave of Mr. Edward Bright, the celebrated "fat man of Essex," is now visible under the gallery, from the removal of the pews, and some other curious epitaphs have come to light.

Warrington.—The foundation stone of St. Ann's Church, Town's-end, has been laid. The edifice is designed in the Early Gothic style, and is to be constructed almost entirely of bricks burnt to a light colour. All windows, doorways, vaulting-shafts, and piers, and other ornamental portions, are to be executed in moulded brickwork. In plan the church consists of a nave 77 ft. long and 42 ft. wide, which is entered by two porches, one on the north and the other on the south side. The whole width of the nave to the west of the porches is raised by three broad steps, on which are arranged seats for the accommodation of about 260 children. The whole church, including nave, chancel, and choir, will accommodate about 600 persons. The chancel, 32 ft. long by 18 ft. wide, is vaulted in brickwork, and is 36 ft. high to the top of the vaulting: the east end terminates in a semicircular apse, round which are placed five two-light windows, having stone tracery of simple design. If the funds will admit, it is intended to fill these windows with painted glass. Between them the vaulting-shafts are carried down to the ground, and there are large buttresses on the outside. An arch of moulded brick on the south side of the chancel opens into the organ-chamber, which is 14 ft. square, and placed under the tower; this is also vaulted in brickwork, and is separated from the chancel by a metal screen. Another arch of moulded brick opens from the organ-chamber into the nave. The semicircular apse of the chancel will face Winwick-road, and will be about 38 ft. high on the exterior, not including the roof. The tower will be 70 ft. in height, the roof rising 20 ft. above this, the staircase turret being carried to the full height of the tower, terminating in a circular-pointed roof. The building is estimated to cost from 4,000*l*. to 5,000*l*. Mr. John Douglas, of Chester, is the architect; and Messrs. Gibson & Sons, of Warrington, are the builders.

Books Received.

From Calcutta to the Snowy Range. By an Old Indian. London: Tinsley, Catherine-street, Strand. Calcutta: Wyman & Co., Hare-street. 1866.

This very interesting volume contains the narrative of a trip through the upper provinces of India to the Himalayas, and gives an account of Monghyr, Benares, Allahabad, Cawnpore, Lucknow, Agra, Delhi, and Simla, through all of which the author passed on his way. The volume is illustrated by engravings from photographs and drawings, and by a map of the route. The author, we happen to know, is Mr. Wyman, of Calcutta, publisher and newspaper proprietor. He is a skilful writer, and has here produced a pleasant and readable book, which must be extremely useful to those who seek health in the Himalayas after too long a business campaign in Calcutta or elsewhere in our Indian provinces. The author, who must have felt the want of just such a work as his own when he began his tour, has here provided for all who follow him a thoughtful and profitable guide book, adviser, and literary and historical companion. Travelling through the upper provinces of India is quite a different thing now-a-days from what it was before the railway era. Now, there is railway conveyance from Calcutta all the way to Delhi, by Benares, Lucknow, Agra, and other of the cities already named; and the remainder of the route to the Indian Sanitarium, Simla, in the Himalayas, is comparatively short. The Kootûb has not yet become a railway station, nor the Taj a monster hotel, but the Governor General can now book himself and his carpet bag by first-class to Delhi, and so put an extinguisher on his slow, though splendid, progresses through the country as of yore. Mr. Wyman complains much of the railway management, which renders railway journeying in India quite a different thing as yet from a railway trip at home. The Indian stations are ill-arranged, the trains irregular, the carriages dirty, and the hotel accommodation is bad.

The volume is interspersed with graphic though brief descriptions of the principal edifices which the author visited on his way; and the interest of many of these descriptions is enhanced by the historical remarks connected with each respectively, and especially with those which relate to the late rebellion. In respect to the Indian structures generally,—at least to those of a Mahometan character, the author says,—

"It is objected by some that the remains of the mighty structures erected by the Mahometan rulers of Hindostan are devoid of interest from the great similarity in style. Similar they are, it is true; but I think it will be found that each possesses special claims and merits of its own; and the historian or the traveller will add greatly to his knowledge and to his pleasure by a careful study and comparison of their several specialities. The buildings of Akbar are almost invariably of red sandstone, elaborately wrought. Those of Shah Jehan, on the other hand, are mostly of marble; whilst the structures of the Patans are celebrated for a wondrous massiveness of construction, combined with an exquisite elaboration of detail. Indeed, it is said of them that they built like giants, and finished like goldsmiths."

Of the architecture of Lucknow, our author, however, admits that,—

"Much of the effect which would otherwise be produced by the magnificent structures in Lucknow is lost from very sameness. The architecture all partakes more or less of the same character, as do also the decorations of the buildings. The designs are pure Moresque in most cases, and the Palace of the Alhambra will give, in its various parts, a copy of almost all the styles of stone carving and decoration in Lucknow."

We may quote from the account given of the chief architectural gem of Lucknow,—the great Imambarra:—

"This truly magnificent hall, said to be the largest in the world, stands on an elevated terrace approached more immediately from two vast square courts, richly laid with tesselated pavements, the innermost court being elevated considerably above the other, adding thus to the effect of the building as viewed from below. It is described as 'The crowning work of Nawab Asf-o-dowla's reign. He is said to have spent incredible sums on it, and the native report, always prone to exaggerate, puts the cost at a million sterling. The architects were invited to submit their plans to a competition, Asf-o-dowla only stipulating that the building should be no copy of any other work, and that it should surpass anything of the kind ever built in beauty and magnificence. Kyfeent-ool-lah was the name of the successful competitor, and it would be hard to say that its conception, as it stands before us in the present day, falls at all short of the large and liberal stipulations of the monarch. The building is as solid as it is graceful, built from very deep foundations, and no wood-work is used throughout.'

The Great or Royal Imambarra is now used as an arsenal, and, fitted with the stern implements of war, it presents a striking contrast to what it must have done when in the time of its splendour. The great hall is 162 ft. long by 53 ft. 6 in. wide, and lofty in proportion, with carved and highly ornamented roof. On the two sides are verandahs, respectively 26 ft. 6 in. by 27 ft. 3 in.; and at each end is a fine octagonal apartment, 53 ft. in diameter, the whole interior dimensions being thus 263 ft. by 145 ft. At the death of its founder he was interred here, but during his lifetime it was probably used as the grand celebration place for the Mohurrum.

On the capture of the Imambarra by Sir Colin Campbell, at the taking of Lucknow, the chandeliers, mirrors, and the like, were ruthlessly destroyed by our infuriated troops; and Mr. Russell describes the marble floor as having been 3 in. thick with the *débris* of the valuable decorations it contained. To the right of the Imambarra stands a copy of the Delhi Jumma Musjid, having two lofty four-storied minars or towers, an ascent to the upper galleries of which is rewarded by a truly superb view of the city and surrounding country.

The Great Imambarra stands near the Room-i-Durwâzâ or Constantinople Gate of Lucknow—a gate built, it is asserted, on the model of that which gave to the Court of the Sultan of Turkey the title of 'The Sublime Porte.' The gate is grand and elegant in style, and well harmonizes with the Imambarra itself."

Before closing our notice of this volume, we will give the author's account of the splendid fluted round tower near Delhi, called the Kootub Minar:—

"The buildings of which it originally formed the centre and chief ornament have decayed to a picturesque ruin, but the noble column remains untouched, apparently, by the hand of time, and bids fair to outlive many another generation.

The tower, which is the highest column known, is built of red sandstone in five stories, narrowing gradually, from a circumference at the base of 159 ft. to one at the top of 24 ft.; with 12 ft. diameter at top and 48 ft. 4 in. at bottom. Around each story run several horizontal belts, elaborately inscribed with passages from the Koran—very marvels of patient genius. The summit is reached by an interior winding staircase, lighted by loopholes of great breadth inside, but narrowing to almost vanishing point as they reach the outer thickness of the wall, focussing thus, as it were, the outer light from without. A survey of the huge blocks of sandstone, hard almost as granite, with which the tower is built, with the prodigious circumference of the base, diminishes the scepticism first entertained as to the endurance of the structure through so many years. On each story is a balcony, where you gladly rest between the pauses of the ascent, which is by 375 steps of about a span each. The tower is 242 ft. high to its *present* summit, the top canopy having been removed, when struck by lightning, some few years ago.* This exceedingly ornamental cupola has been erected on a piece of ground adjoining, and when on the summit of the tower must have added greatly to its effect.

The Kootub is reputed to have been built some 700 or 800 years ago, by Sultan Sham-Shood-deen, in honour of the holy fakir who foretold him the birth of an heir; and it is stated that it took forty years to complete. The legend also runs that it was erected by the Rajah of Prithie for a favourite daughter, who desired to possess a tower with its top nigh unto heaven, from whence she

* It is said that the only Mahometan building known to be taller than this is the mosque of Hassan, at Cairo.

might offer up her prayers. Other accounts describe the Kootub as one of two minars designed by Sultan Sham-Shooddeen to flank a mighty mosque in everlasting remembrance of Kootub-ood-deen, who, to his qualities of general, added those of a saint. His tomb is still venerated and maintained with some show of state, being visited by thousands of devout Mussulmans. From out of the chaos of legend and superstitious chronicles it is impossible to gather any certain or precise information as to the origin of this famous structure."

Other round towers are described, one of them the celebrated Buddhist tower, near Benares, supposed to have been built about 530 B.C., and which was seen and described by Hwen Tsang Fa Hiang, the two ancient Chinese travellers, in the beginning of the fifth century, A.D. It is 110 ft. high, and 93 ft. in diameter at the base. The structure is solid. We cordially recommend the book.

Miscellanea.

The New Law on the Thames Navigation. One of the most important Acts passed in the late session, the Thames Navigation Act, has been printed. It contains ninety-one sections and two schedules, and from its general importance was referred to in the Speech from the Throne when Parliament was prorogued. The conservancy of the river is now vested in the conservators from Staines to Cricklade, Wilts. The Upper Navigation Commissioners are discontinued, and with five additional conservators (one to be appointed by the Board of Trade) and the eighteen existing conservators, the traffic of the river is to be carried on, and effectual means adopted to prevent the pollution of the water, with the provision that another Act is to be applied for in relation to the Thames between Staines and the western boundary of the district under the authority of the Metropolitan Board of Works. One of the sections states, that "the conservators shall cause the surface of the Thames to be (as far as reasonably practicable) effectually scavenged, in order to the removal therefrom of substances liable to putrefaction." There is a distinct enactment on the "pollution of water," and no sewage is to be poured into the Thames under heavy penalties. Each of the metropolitan water companies is to pay 1,000*l.* a year beyond the present payments.

Decoration of the new Grand Opera House of Paris.—The paintings in the interior are to be entrusted to MM. Baudry, Boulanger, Barrias, Delaunay, Gérôme, and Pils. It is said that the designs for these internal decorations, which have been submitted to the judgment of M. Garnier, the architect of the work, amount to several thousands in number. The list of the statues and busts which are to decorate the exterior of the building and the vestibule is published officially. The *Journal of the Society of Arts* says,—On the principal façade, in the tympans of the arcades of the main entrance, will be medallions of the composers Cimarosa, Pergolesi, Bach, and Haydn;—in the grand vestibule four seated statues of the four chiefs of the schools of Italy, France, Germany, and England,—Lulli, Rameau, Gluck, and Handel. In the seven *œils de bœuf*, or small circular windows, are to be seven bronze busts, gilt. The centre will be that of Mozart, born 1756; and those of the other composers will be placed on each hand, according to the dates of their birth. Thus to the right of Mozart will be Beethoven, born 1770; Auber, 1782; and Rossini, 1792; and on the left Spontini, 1774; Meyerbeer, 1794; and Halévy, 1799. On the return of the façade, busts of two librettists,—Quinault and Scribe. On the two lateral façades are to be placed twenty-four busts in chronological order. On one side Monteverde, Durante, Jomelli, Monsigny, Gretry, Sacchini, Lesueur, Berton, Boieldieu, Herold, Donizetti, and Verdi; on the other, Cambert, Campra, Jean Jacques Rousseau, Philidor, Piccini, Parsiello, Cherubini, Méhul, Nicolo, Weber, Bellini, and Adam. In one of the foyers are to be placed busts of celebrated architects, or others connected with opera. Amongst the sculptors employed are M. Carpeaux, whose fronton for the *Pavillon de Flora* of the Tuileries has attracted so much well-deserved admiration, and which we have mentioned in our notes on the late Paris Salon; M. Denecheaux, and M. Bruyer. Amongst the reports afloat respecting the decoration of the interior, is one to the effect of M. Meissonnier having made proposals for departing from his micrographic style, and executing colossal works on the walls of the salon in the rear of the Emperor's box.

Etching on Glass.—In reply to an inquiry, etching on glass is performed by laying on the glass a ground of bees' wax, and drawing the design thereon with the needle, as in etching upon copper. Sulphuric acid is then poured on, and fluor spar sprinkled on it. After four or five hours it is taken off, and the work cleaned with oil of turpentine.

The Carlisle Water Supply.—The local council have resolved, by a majority of 25 to 9, "that a new committee be appointed to consider the whole water question, having regard to Mr. Lawson's and Mr. Simpson's pumping schemes, as well as that proposed by Mr. Nelson, but leaving out of view the Glenderamackin scheme as impracticable under existing circumstances."

International Piscicultural Exhibition at Boulogne. — An international exhibition of articles connected with fisheries has been opened at Boulogne with great ceremony. These exhibitions are rare, being utterly unknown in England, and three having only been held on the Continent,—namely, at Amsterdam, Bergen, and Archchon. The Boulogne exhibition is very complete, and embraces every kind of article used in connexion with fishing and fisheries. England is said to be the country worst represented on this occasion, and this is much to be regretted. The exhibition is to remain open until the 13th of October. The main portion of it is contained in the Halle au Poisson.

The late Mr. W. G. Ginty, Engineer.—We have to announce the death of Mr. William Gilbert Ginty, which occurred suddenly at Rio de Janeiro on the 13th ult. Mr. Ginty formerly followed the profession of a civil engineer in Manchester, and was engaged in the construction of the railway between Bolton and Liverpool. He was associated with a number of enterprises in Manchester. He removed to Rio on being engaged as the agent of the Baron de Maua, who then had the Imperial Gasworks on his hands. Mr. Ginty's active and wise administration soon lifted that undertaking from a depressed condition into one of prosperity. At the request of the Baron de Maua, Mr. Ginty took upon himself the administration of the Tijuca railway, running from Rio to Tijuca Serra, and his energy was soon perceptible in the improvements he introduced. Some years ago the Emperor of the Brazils recognised his public services by conferring upon him the honour of knighthood in the Brazilian Order of the Rose.

Artificial Diamonds.—A correspondent reminds us that M. Despretz, of Paris, in 1853, succeeded in fusing and crystallizing carbon by means of a galvanic battery, thus producing microscopical diamonds. Of this fact we were quite well aware, although the writer of our remarks (we may state in reply to a question put by our correspondent), was not M. Despretz. What we wanted, however, was not microscopical diamonds, but good large ones; and hence it was that we suggested a new process,—namely, the subjection of carbon along with sulphide of carbon to galvanic action, in order to see whether the so galvanized sulphide would not dissolve an additional dose of the carbon, which might then be crystallized in its precipitation, on the gradual diminution and withdrawal of the galvanic action. Fragments of diamonds might predispose to crystallization. We now observe that yet another process has just been tried and reported on to the French Academy of Sciences, in which sulphide or sulphuret of carbon has also been used, but in another way, and without additional carbon. "M. Lionnet," says *Galignani*, "communicated to the Academy a process of his for obtaining pure carbon (diamond) in a crystallized state. His plan consists in taking a long and thin gold or platinum leaf, rolling upon it a thin piece of tinfoil, and putting it into a bath of sulphuret of carbon. The liquid is decomposed under the influence of the weak electric current thus excited; the sulphur combines with the tin; and the carbon is deposited in crystals at the bottom of the vessel. The author thinks diamond must be produced by nature in a similar way." According to this report, artificial diamonds have actually been got by means of galvanic and chemical action from sulphide of carbon. Had they been large and valuable, we dare say M. Lionnet would not have been in a hurry to report his progress. It remains to be seen whether our method be not a still better one than M. Lionnet's, considering that there would be an indefinite supply of carbon under galvanic action along with the sulphide, and probably no destruction of the solvent.

The Inclosure of Plumstead Common.—An address, signed by several influential residents of the district, has been issued, in which it is said, "Mr. Julian Goldsmid, M.P., has agreed to test the right of the lords of the manor to inclose, and fight the battle to an issue, at his own expense, provided that a committee for the purpose would raise half the cost (estimated at 500*l.*), which committee has been formed, and, relying upon the support of the people, has entered into the required undertaking with Mr. Goldsmid. The committee confidently anticipate that subscriptions will readily flow in to relieve them of their responsibility, especially when it is known that the public have rights over these commons of which they have been arbitrarily deprived, and that the law is sufficient, if properly administered, to afford a remedy."

The Thames Embankment.—During the past six weeks the works of the Embankment on the north side of the river have progressed rapidly. The outer or river wall is completed in several sections, and in general it is above the high water (spring tides) level. In those sections where the piling has been removed the work appears to advantage from the river. The construction of the new steamboat piers at Westminster, Hungerford, and Waterloo bridges is being proceeded with. The filling in of No. 1 contract (Mr. Furness), extending from the east side of Westminster-bridge to Waterloo-bridge, is nearly completed; and that in No. 2 contract (Mr. Ritson's), from the east side of Waterloo-bridge to the east side of the Temple-gardens, is level with the upper part of the wall. On the south side the embankment from the west side of Westminster-bridge to Bishop's-walk, Lambeth Palace, is approaching completion, the difficulties with which the engineer and contractor had to contend being trivial compared with those on the north bank of the river.

Alarming Explosion of Gas at Mr. Creswick's.—On Wednesday in last week considerable alarm was caused in Bloomsbury-square, owing to a loud explosion, in the mansion occupied by Mr. Creswick, the tragedian. It appears that one of the burners of a chandelier in the back parlour had been left open, and when the meter was turned on to supply the other portions of the house, the gas escaped and accumulated in the parlour, and a servant, on going into the room for the purpose of lighting the chandelier, struck a lucifer-match, when the gas exploded, knocking her down, scorching her face, blowing out some windows, forcing down the plaster cornice, and sending about in terrible confusion some of Mr. Creswick's valuable pictures. The gas was turned off from the main, and no further damage was done. This accident might have been avoided, had the patent whistling signals been attached to the burners. Turning off the gas at the meter while some room or other may be lighted, and thus leaving the tap open till next evening when the gas is again put on at the meter, is almost certain to cause an explosion. Every light ought first to be put out before the gas is turned off at the meter; this is the only safe rule: better to leave it on at the meter than fail to put out all the lights first.

The British Association. — The opening meeting of the Association at Nottingham took place on Wednesday. Mr. Grove, Q.C., is the President for the present year. The excursions are of an interesting character. The extensive coal-fields of Mr. North, at Cinder Hill, will be inspected on the 25th, under the superintendence of Mr. R. Barber. A description of the geological features of this valuable mineral district will be delivered by Mr. Fowler, C.E. The same day Newstead Abbey, Annesley, Alfreton Ironworks at Riddings, and the Midland Railway works at Derby, will be visited. Excursions to Charnwood Forest will take place on the 30th. The geological district comprised in this excursion includes the Museum of Lias Fossils at Barrow, Mr. Ellis's limestone quarries, the Swithland Slate Quarries, the Monastery of Mount Saint Bernard, Taylor's bell-foundry at Loughborough, &c. On the same day the ironworks at Codnor Park and Butterley, with the rolling-mills, collieries, and other objects of interest in the surrounding district, will be inspected under the guidance of Mr. Alleyn and Mr. Bean. Matlock, Darley Dale, Chatsworth, Haddon Hall, Monsall Dale, Castleton, and Buxton will be visited on the same day. Bakewell Church and Cross will be visited. Nottingham presents an animated appearance, and effort is being used to make the visit a decided success.

South Kensington Museum.—The number of visitors during the week ending 18th August, 1866, was, on Monday, Tuesday, and Saturday (free), 12,331; on Wednesday, Thursday, and Friday (admission 6d.), 1,426; total, 13,757. National Portrait Exhibition by payment, 11,781; schools at 1s. per 30, 1,946.

A Testimonial.—Last week a testimonial was presented to Mr. Thomas Dawson Ridley, the engineer to the contractor (Mr. Ritson) of the Thames Embankment, North, contract No. 2. The inscription on a salver, forming part of the testimonial (a tea and coffee service, together with a timepiece), stated that it was given by "the members of the staff, workmen, and friends, as a mark of their esteem." The testimonial was presented by Mr. Thomas Gabriel, of the firm of Thomas Gabriel & Sons.

The Clock Tower at London Bridge.—At a recent meeting of the Metropolitan Board of Works, the Works and General Purposes Committee brought up a report calling the attention of the Board to the amounts of the tenders received by the committee for the removal and re-erection of the Clock Tower, handed over to the Board by the St. Saviour's District Board, amounting to above 1,000*l.*, the original cost of the tower being 676*l.*, and recommending that a communication be addressed to the District Board, thanking them for their offer of the Clock Tower, and expressing the regret of the Board that, under the circumstances, they are unable to avail themselves thereof. This was approved.

The Closing of Filthy and Overcrowded Dens in Southwark and Islington.—On evidence given before the police magistrates, twenty-three houses in Magdalen-court, Tooley-street, St. Olave's, Southwark, and seventeen in Henry-place, Copenhagen-street, in the parish of St. Mary, Islington, have been ordered to be immediately cleared of inhabitants, and closed, as nuisances and unfit for habitation, till repaired, the cost of repair to be repaid to the parish authorities by the defendants. The houses in Magdalen-court, Southwark, belong to Magdalen College, Oxford, who declined to act in the matter. The court is a *cul de sac* at best, even though the houses were otherwise in a habitable state.

Death of a Sculptor.—We record the death of Mr. David Dunbar, sculptor, which sad event took place at Dumfries. He had his early aspirations of seeing Rome and studying in Italy realised through the kindness of some friends who had long watched the genius of the embryo sculptor. On his return to this country he entered the studio of Sir Francis Chantrey. Upon leaving London he began business on his own account, and executed many works. His best works are busts from the life, and some copies in marble from the antique. He had sittings from Earl Grey, Lord Brougham, Lord Durham, and other eminent statesmen; and he executed a bust of Grace Darling, which was several times reproduced in marble for the Bishop of Durham and others.

The Fatal Panic in Paris during the Emperor's Fete Day.—In the Rue de Rivoli the two currents of promenaders met together, and a frightful crash ensued. Dresses were torn, families separated—the confusion, in fact, was awful. The terror-struck people climbed up the iron railings of the gardens of the Tuileries, while lots of poor women and frightened children were hoisted up to the parapets and terraces by their distracted fathers and brothers. One poor mother who witnessed the trampling to death of her infant is now a raving lunatic. At least 1,000 persons were massed on the bridge; women ran madly along the parapet; others fainted, and were trodden to death, and children also. Five corpses were deposited in one of the halls of the Palais Législatif, opposite the bridge, as well as about 170 wounded. At the apothecary's shop at the corner of the Rue de Bourgoyne, several more corpses were to be seen; and others were found in a house in course of construction at the corner of the quay where numbers of the wounded had sought for shelter, and some of whom expired there. As to the shoes, hats, coats, and petticoats picked up by the police it would be impossible to enumerate them. The real cause of the catastrophe, it is said, has been ascertained to be that a number of pickpockets organised a panic beforehand, shouted danger when there was none, and unfortunately succeeded but too well in carrying out their infamous design. Several arrests have taken place.

Iron Mile-posts for Railways. — A patent has been taken out by Messrs. J. & G. Goad, for the manufacture of iron mileage posts for the use of railways. They will be made of cast iron and galvanized. The figures, instead of being painted on the iron, will be formed open through it on a dark ground, obviating, therefore, entirely the necessity of painting or renovation.

Extreme Carelessness in Storing Gunpowder.—A quarryman, at Dumbarton, had a quantity of gunpowder stored in his house, and some children who were playing with lucifer matches close to where a barrel of it stood let a spark fall, and the gunpowder exploded. The house was at once reduced to ruins, and twenty persons, forming four families, were more or less injured.

Labourers' Dwellings in Liverpool. — The special committee appointed by the Liverpool Health Committee to promote this object have reported that they have made a representation to the Loan Commissioners in order to ascertain upon what terms money could be lent to the corporation for the purpose of erecting improved labourers' dwellings, now one of the most urgent local requirements.

The Site of Ophir. — The last antiquarian sensation is the discovery of what is supposed to be the ancient gold-exporting city of Ophir, of Biblical fame. The locality is in that part of South-eastern Africa lying to the north of Zululand. The tribe living there allow, it is said, no approach to the ruins, from which it is supposed they procure thence the materials for the manufacture of certain gold ornaments they are in the habit of wearing. Discarding probable falsehoods and exaggerations, the truth of the matter may be that gold is found in the corner of Africa indicated, and that there are some traces there of an ancient civilised settlement.

Fall of Part of a Railway Station.—A part of the roof of the Preston Railway-station has fallen in. The condition of the station has been complained of for years, and the Preston corporation have time after time sought to induce the owners, the London and North-Western and Lancashire and Yorkshire Companies, to remove or improve it. It was the roof of the eastern side of the station which gave way, hurling glass in all directions, and throwing large iron girders upon seats generally occupied by passengers, tearing huge pieces of wood in pieces, smashing the booking-office windows, and completely demolishing a portion of the roof, measuring about 40 yards in length. A woman was very badly cut in the head, and a pointsman had a narrow escape.

Large Bridge for the Central Argentine Railway.—The largest bridge ever undertaken for South America is now being constructed in England for the Central Argentine Railway, to be placed over the Rio Segundo eight leagues this side of Cordova. The length is upwards of 400 varas, and with its masonry and approaches upwards of 500 varas. The entire construction is of iron; it is to consist of thirty-two spans resting upon cast-iron pillars 14 in. in diameter, and secured into the ground, each pillar having a minimum height of 25 ft. It is to be supported above by longitudinal girders of iron, the framing and ties all of wrought iron. The first sections of this large bridge are now on their way to Rosario, whence they will be conveyed by rail to Frayle Muerto and other points as the road advances, and taken by carts to the Rio Segundo. The section will require nearly a year.

The Atlantic Telegraph.—The diary of the *Great Eastern* has been received, but is comparatively tame, as there were no startling events to record. There was only one sensation scene during the voyage, when a foul flake took place in the after tank, but it was soon rectified. If the cable continue in successful working order, a contract will speedily be made between the American "Associated Press"—a great combination of nearly all the daily newspapers published in the United States and Canada—and the Cable Company for the regular transmission of news. This is to be done upon the basis of the transmission of a daily despatch from Europe of about forty words, for which the American press are to pay annually the snug sum of 110,000 dollars in gold, or 22,000*l.* It will cost the American newspapers over 70*l.* a day for their little despatch of forty words, which can readily be printed in five lines.

Increased Supply of Water in the Strand and Holborn Districts.—On Saturday the Holborn and Strand District Board of Works, in order to co-operate with the New River Company in their gift of an increased supply of water from the company's mains, erected cast-iron stand-posts, with self-closing taps, in conformity with the company's suggestion, in the most densely populated localities within their respective districts. In Marylebone, St. Pancras, Paddington, and the districts at the east-end of the metropolis, similar stand-pipes and posts are being fixed. This supply is in addition to that also given gratuitously on Sunday mornings.

TENDERS

For additions to the Kent County Lunatic Asylum, comprising day rooms and dormitories, for about 100 patients. Mr. Martin Bulwer, architect. Quantities supplied by Mr. Geo. Ruck, Maidstone:—

Stiff	£6,938 0 0
Anscomb	6,258 0 0
Simms & Marten	5,988 0 0
Naylar & Son	5,930 0 0
Grenated	5,800 0 0
Vaughan	5,600 0 0
Wallis & Clements (accepted)	5,565 0 0

For the erection of Lecture-hall and Reading-room, Lenham, Kent, for the Lenham Institute Company. Mr. William Powell, architect:—

Clark & Co.	£791 5 0
Head	637 10 0
Pell	599 0 0
Peters	579 0 0
Norris	558 2 0
Coast	540 0 0

For alterations to No. 19, Brompton-road, for Mr. C Lyons. Mr. T. Danby, architect:—

Coleman	£929 0 0
Sims & Marten	794 0 0
Coils & Son	744 0 0
Chutter	729 0 0
Foster	674 0 0

For the erection of four cottages at Wall End, Essex. Mr. J. W. Dennison, architect:—

Riddall	£650 0 0
Withers	650 0 0
Ellis	580 0 0
Stokes (accepted)	545 0 0

For the erection of Convalescent Wards at Southall Schools, for the Directors and Guardians of the Poor of the Parish of St. Marylebone. Mr. H. Saxon Snell, architect. Quantities supplied:—

Brown	£655 0 0
Bell	644 0 0
Gibson, Bros.	594 0 0
Wilkinson & Co.	573 0 0
Hanson (accepted)	538 10 0

For New Reform Club, 71, Jermyn-street. Messrs. Porter & Markham, architects. Quantities by Messrs. Richardson & Waghorn:—

Wells	£8,740 0 0
Coleman	8,620 0 0
Bland	7,896 0 0
Rider & Son	7,700 0 0
Hart	7,650 0 0

For the erection of a warehouse and manufactory for Messrs. Harper & Son, at Clerkenwell, with fire-proof construction. Mr. J. Mucklow, architect. Mr. F. Warburton Stent, surveyor:—

Kirk	£4,805 0 0
Turner & Sons	4,353 0 0
Sawyer	4,330 0 0
Brass	4,111 0 0
Sabey	4,050 0 0

For a pair of semi-detached villas, Ilfracombe. Mr. M. C. W. Horne, architect:—

Call & Pethick	£2,100 0 0
Gibbs	2,077 0 0
G. Reed	1,725 0 0
Jos. Reed	1,687 0 0

For house at Cheetham-hill, Manchester, for Mr. Rich. K. Cooper. Messrs. Hayley & Dawes, architects (exclusive of fittings):—

Thompson (accepted)	£1,858 0 0

For erection of ragged schools, Charter-street, Manchester. Messrs. Hayley & Dawes, architects (exclusive of fittings):—

Davison (accepted)	£1,220 0 0

For two houses and shops for Mr. Lambert, Red-hill, Surrey. Mr. J. F. Mathews, architect. Quantities supplied:—

Barnes	£3,399 0 0
Nightingale	3,242 0 0
Langley & Turner	3,230 0 0
Wesley	2,990 0 0
Simms & Marten	2,948 0 0
Gage	2,790 0 0
Holdsworth	2,650 0 0

For alterations, &c., to "Golden Lion," Bagnigge Wells-road. Messrs. Bird & Walters, architects:—

Ennor	£1,530 0 0
Harvey	1,498 0 0
Langmead & Way	1,467 0 0
Newman & Man	1,412 0 0
Williams & Son	1,378 0 0
Kelly (accepted)	1,357 0 0

For alterations, &c., to "Mitre" Tavern, Mitre-court, Fleet-street. Messrs. Finch Hill & Paraire, architects:—

Langmead & Way	£1,854 0 0
Eaton & Chapman	1,838 0 0
Newman & Mann (accepted)	1,686 0 0

TO CORRESPONDENTS.

Mr. R.—Mr. H.—H. S. S.—J. W. D.—R. P.—F. G.—Mr. F.—E. M. B.—Miss B. P.—R. G. T.—W. P. G.—C. H. F.—H. H.—J. N. B.—Messrs. C. & L.—F. W. S.—C. R. J.—J. K.—W. W.—J. C. H.—E. K.—G. J.—Two Hard-working Men.—J. F. M.—W. L. & Co.—L. M. T.—W. S. & Son.—W. R.—J. F.—T. M. R.—A. M.—W. D. A.—Alpha.—W. T.—E W. T.—H. C. G. (form of numerals is more modern than the date given. Can we have a rubbing?)

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Advertisements cannot be received for the current week's issue later than **THREE o'clock, p.m.,** *on THURSDAY.*

[ADVERTISEMENT.]

CHURCH, TURRET, and STABLE CLOCKS. J. W. BENSON, having erected steam-power and improved machinery for clock-making, at the manufactory, Ludgate-hill, will be glad to furnish to clergymen, architects, and committees, Estimates and Specifications of every description of Horological Machine, especially cathedral and public clocks, chiming tunes on any number of bells. A descriptive pamphlet on Church Clocks post free for one stamp. Watch and Clock Maker by Warrant of Appointment to H.R.H. the Prince of Wales, and maker of the great clock for the Exhibition, 1862. 25, Old Bond-street, and 33 & 34, Ludgate-hill, E.C. Established 1749.

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N.B.—The price per acre and per house must include all expenses whatever, except the production of parish maps and references.

Bishop's Castle, August 3, 1866.

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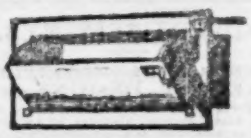

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